WHOLESALER'S SALESMAN

CONTENTS DECEMBER, 1943

Times and Trends ..... O. Fred. Rost 11
Business Index—Sales and Inventories 17
Business Index—Regional Analysis 20
News Notes from N.E.W.A. ..... Alfred Byers 27
Free Enterprise—the Opportunity and Obligation To Compete ..... An Editorial by James H. McGraw, Jr. 33
The Distributor—During and After the War ..... Herbert Metz 36
You Can Sell Plant Broadcasting Systems For More War- And Peace-Time Production ..... F. D. Wilson 40
What's Ahead for Distribution ..... Howard E. Blood 44
Highlights of Tomorrow's Home Lighting ..... S. G. Hibben 48
Markets After the War ..... S. Morris Livingston 50
How Wholesalers and Electrical Inspectors Can Cooperate To Help Win the War—and Peace-Time Business ... A. J. McGivern 56
Appliance Maker Gives Green Light To Independent Post-War Distributors ..... J. H. Rasmussen 61
A Primer of Electronics ..... Don P. Caverly 67
Recent W.P.B. Orders and Revision 82
Wholesaler's Salesman News ..... 29 and 85

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From .....

.....

To .....

.....

Signed .....

Again . . .

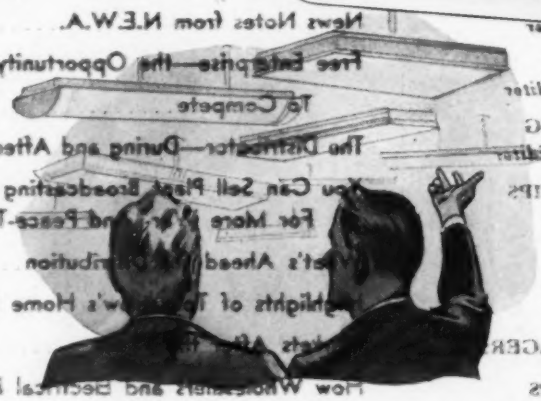
COMMERCIAL

lighting units that bear the label

FLEUR·O·LIER

Certified
FLEUR-O-LIER
The Manufacturer guarantees by affixing this label that this Fluorescent luminaire is a duplicate of samples found by periodic examination to comply with the minimum requirements as set up in the
"SPECIFICATIONS FOR LUMINAIRES, FITTINGS AND AUXILIARIES FOR FLUORESCENT LAMPS"
which are sponsored by the Manufacturers of Mazda Lamps.
Electrical Testing Laboratories, Inc.
NEW YORK, N. Y.
E.T.L.
A COPY OF THIS CERTIFICATE SHOULD APPEAR UPON EACH UNIT PACKAGE

(as authorized by WPB Order L-78, Revised)



AFTER December 1st, 1943, "commercial" fluorescent lighting fixtures bearing the famous FLEUR-O-LIER Certification Label will again be manufactured and made available for "essential" uses. Fixtures of this type are particularly suited to such locations as factory drafting rooms and offices, hospitals and various public institutions.

Many of the leading fixture makers participating in the FLEUR-O-LIER program will manufacture these units, which gives you a wider variety of sizes and designs. These new FLEUR-O-LIERS will combine the best features of pre-war equipment, plus improvements developed to help the war effort. And all will conform to WPB Limitation orders in the use of critical materials.

You can depend on these units, because like all fixtures labelled FLEUR-O-LIER, they are CHECKED and CERTIFIED by impartial experts—Electrical Testing Laboratories, Inc., of New York. They all meet rigid FLEUR-O-LIER specifications for Electrical, Mechanical and Lighting Excellence.

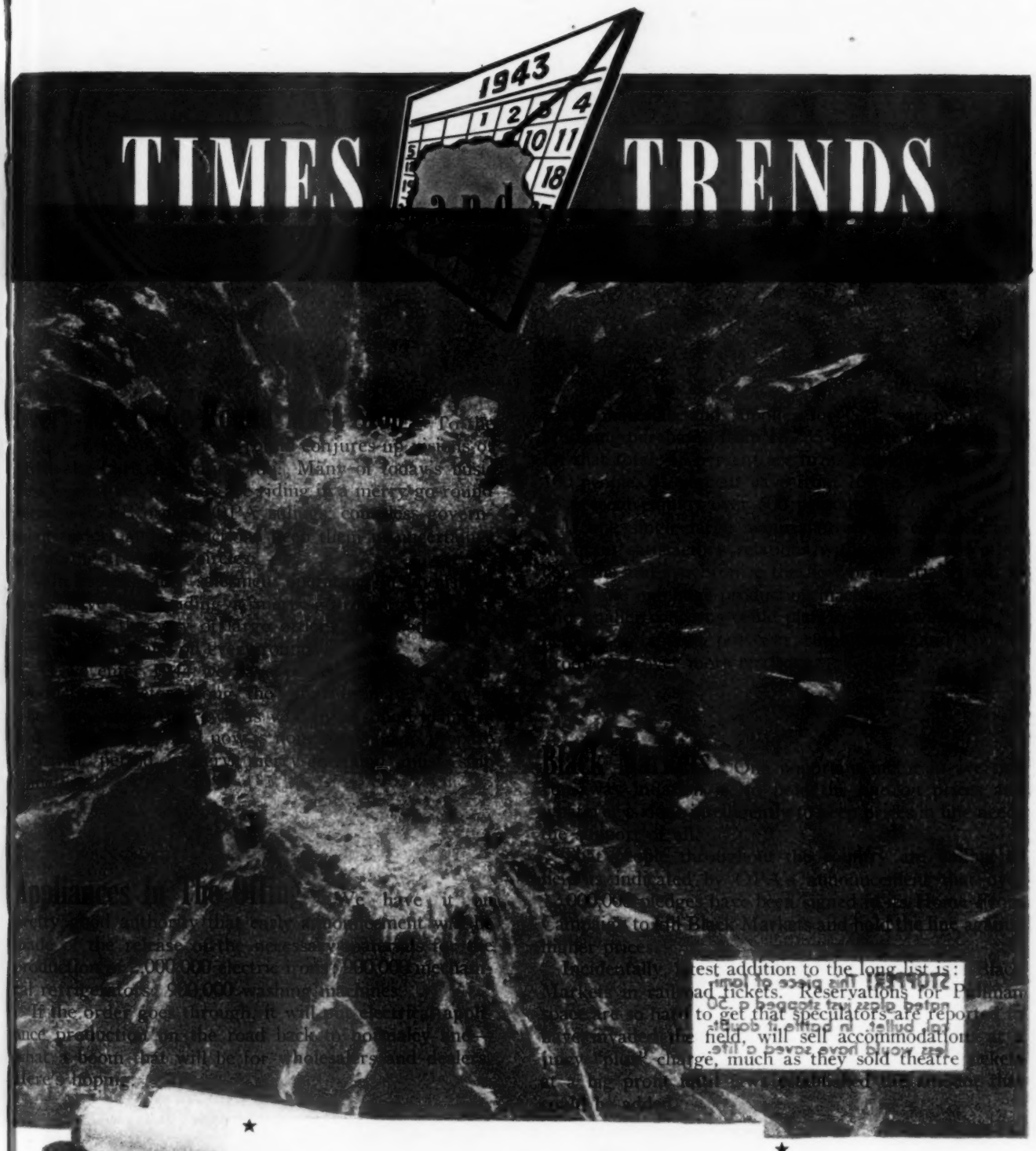
Commercial FLEUR-O-LIERS are available under the terms of L-78, CMP Reg. 5 and other WPB orders. FLEUR-O-LIER MANUFACTURERS, 2121-12 Keith Bldg., Cleveland 15, Ohio.

FLEUR·O·LIER *Manufacturers*

CERTIFIED FIXTURES FOR FLUORESCENT LIGHTING

Participation in the FLEUR-O-LIER MANUFACTURERS' program is open to any manufacturer who complies with FLEUR-O-LIER requirements

TIMES and TRENDS



Permanent Sub-Contracting?

Sub-contracting under pressure of the war emergency has been developed into such a highly satisfactory method of spreading work for greater speed and often lower costs, that it will probably remain and become common practice after the war is over. As a matter of fact, sub-contracting may well become the means by which thousands of small plants can be kept in operation, when without sub-contracting they would have to close up.

General Motors recently published the results of a special survey of sub-contracting which showed that

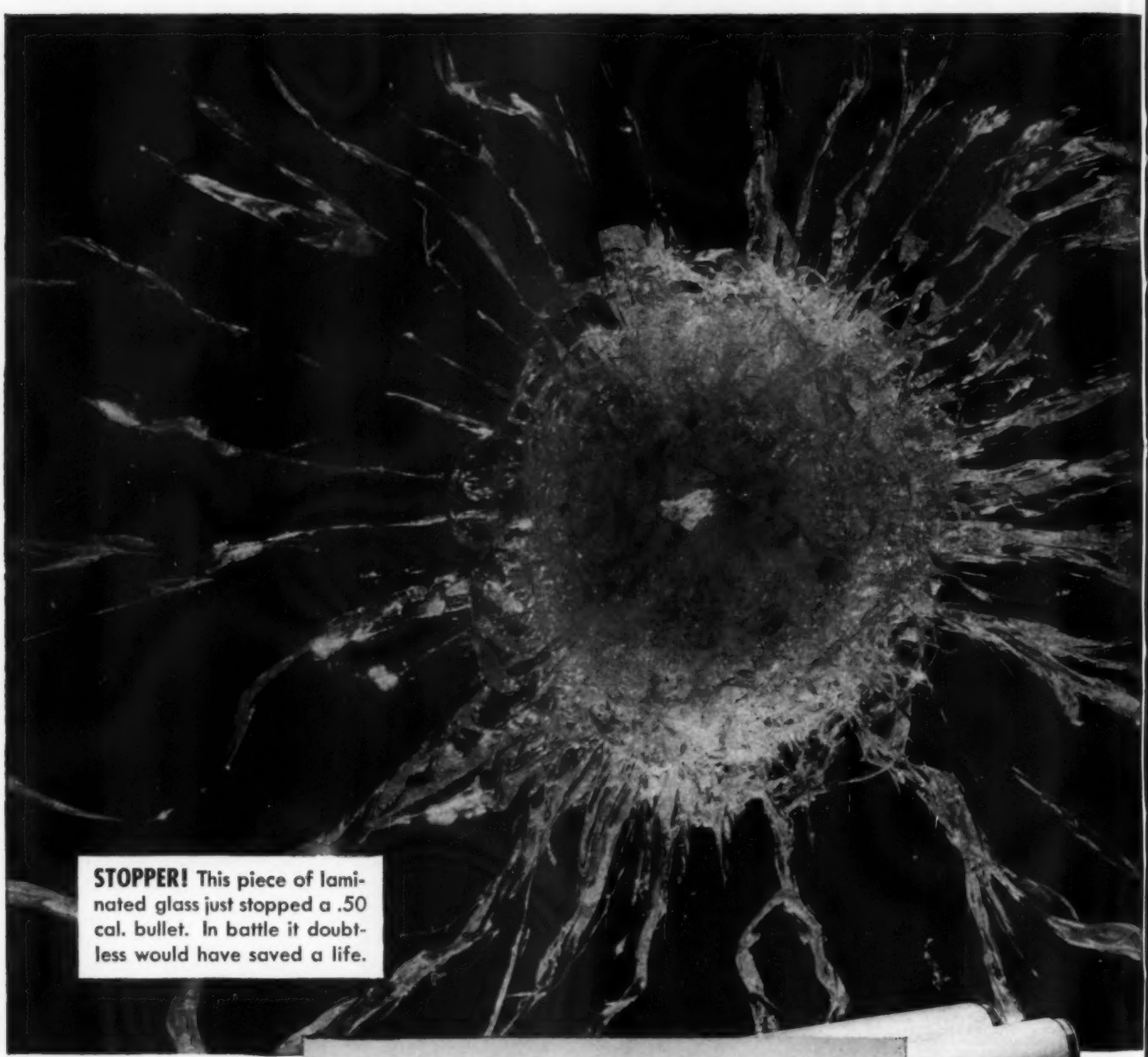
Willow Run

In 1942 WHOLESALER'S SALESMAN devoted its entire July issue to the recording of the outstandingly important contributions made by Detroit electrical wholesalers to the speedier completion of Ford's Willow Run Bomber Plant. Of course, at that time the plant was far from ready for production.

On November 20th, 1943 the War Department released the news that over 300 bombers have been *flown away* and an undisclosed number have been

(*Continued on page* 15)

Greater security for men



STOPPER! This piece of laminated glass just stopped a .50 cal. bullet. In battle it doubtless would have saved a life.

Westinghouse

MAZDA LAMPS

FOR BETTER "SEE-ABILITY"

(*Continued from page* 11)

shipped *knocked down* since the Willow Run plant got into production. Also, a plant representative is quoted as saying: "The next thousand are going to come away fast

Surplus Goods

When Mark Twain made that famous remark about everybody talking about the weather but nobody doing anything about it, he described accurately the present situation in connection with the rapidly growing problem of surplus goods disposal.

In all Washington practically every agency that was engaged in the procurement of war goods frankly admits that the problem will be a stupendous one. Estimates as to the value of goods that will classify as surplus range all the way from $50 to 75 billions. But every agency, being eager to bury its own mistakes with the benefit of counsel, none wants to surrender the disposal rights to some new and perhaps untried agency for surplus disposal.

A solution, in final analysis, little different from suggestions that have come from various quarters, is one uniform policy governing the disposal of all surplus goods, to prevent any sale that would tend to demoralize a particular industry or a specific market area, and the question of whether danger to established business concerns exists should be answered by various industry advisory boards on which all of each particular industry's trade associations should be represented.

Unless business exerts all available pressure now and in the right places and gets a standard policy established, the much talked about post-war business boom will be torpedoed by that looming avalanche of U. S. Government Surplus Goods and the country will sink into a worse depression than that of the "Thirties."

Four Freedoms For Business

We are indebted to our good friend Daniel Bloomfield, Director of Boston's Retail Trade Board and Conference on Distribution, for a declaration of four needed freedoms that at first glance may pertain strictly to business but that are actually as indispensable to the perpetuation of our American economy and our American way of living as are those of the Atlantic Charter.

Here they are:

1. Freedom to exert initiative and creative effort in developing new
2. Freedom to earn a
labor.
3. Freedom to exerci control over one's business, consistent wit the public interest.
4. Freedom to trade with the markets of the world.

If these are freedoms that you too want to see perpetuated, do your share to protect them and quote them whenever and wherever you talk to other business men.

Scrap For The Scrap

The WPB Salvage
is still calling for more scrap metal, points out
participate in a continuous scrap

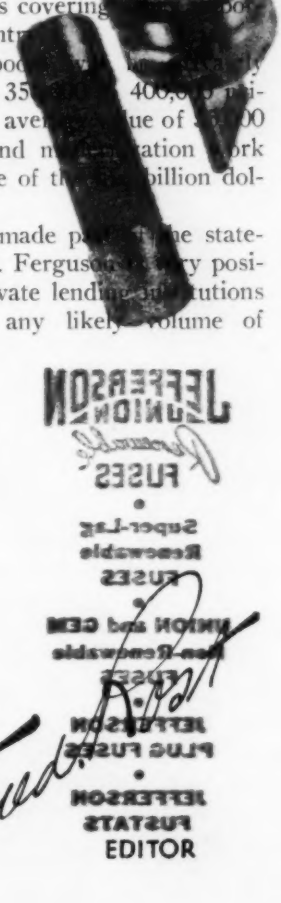
crap requirements to keep
estimated at 15,000,000
4 requirements cannot be
unless battle-field salvage operations account
quantities of battle scrap actually brought
back to this country.

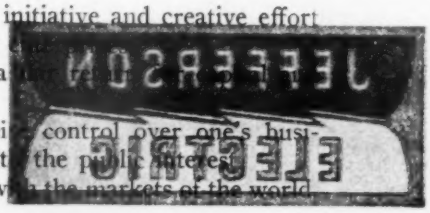
importance of scrap in war production is indicated
by speed with which large manufacturers clear out
cars for shipments to mills witness General Motors
shipped over 66,000 tons of scrap in a single month,
September, 1943, the lot being equal in weight to 2,000
General Sherman Tanks. You can help to get scrap into
the scrap by suggesting prompt sale to scrap dealers
wherever you see any scrap around.

Building Boom

5 Billion Dollar Housing Boom
by the Federal Housing Administration for
after war restrictions are
on being based on the results of a
by FHA's sixty-two field offices covering
tant housing market in the country.
FHA contends that that boo
financed and will involve from 35
vately built dwelling units at an ave
per unit, while home repair and m
is expected to account for three of th
lar total.

Of course certain ifs are made p
ment but FHA Chief Abner H. Ferguso
tive that ample funds from private lending institutions
will be available to finance any likely volume of





EDITOR

JEFFERSON UNION *Renewable* FUSES

- **Super-Lag Renewable FUSES**
- **UNION and GEM Non-Renewable FUSES**
- **JEFFERSON PLUG FUSES**
- **JEFFERSON FUSTATS**

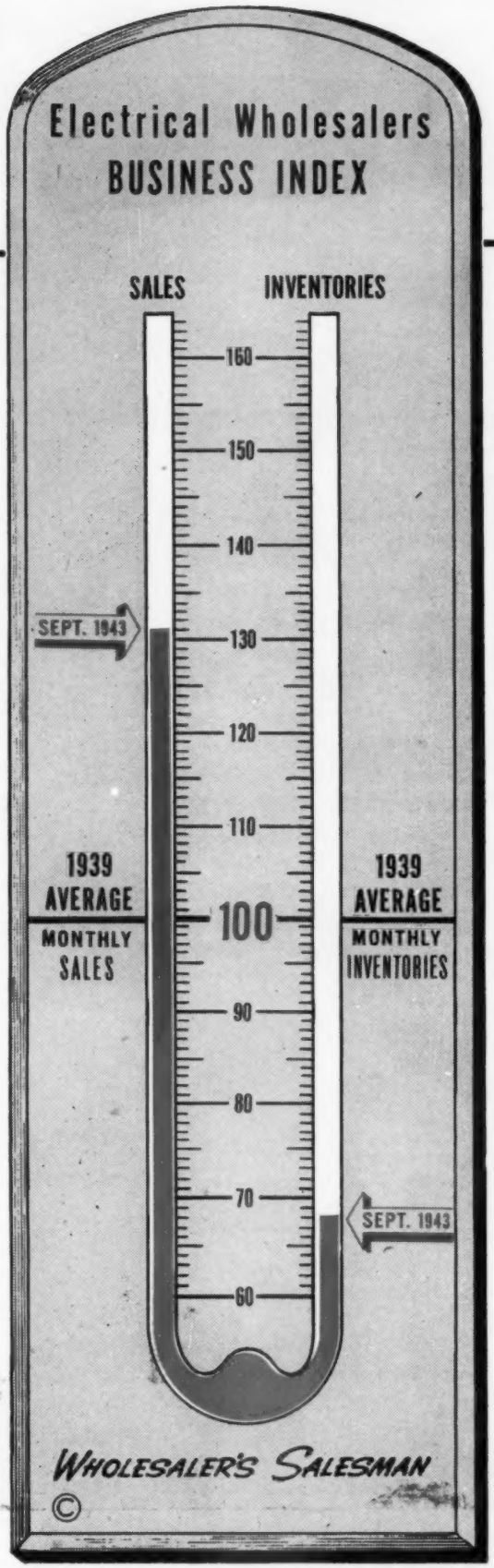
Look To Your FUSES

WHEN a motor is not protected reliably—serious damage may not only put it out of use—but may cause serious production losses along the line.

Too, a burned out motor means an extra drain on critical steel and copper needed for repairing, re-wiring, or replacement.

From the earliest days of the electrical industry Union Renewable Fuses have been the choice of experienced electrical men because of their uniform accuracy and reliability. They give the protection needed today to preserve electrical equipment—insure against production delays,—and blow only when serious damage impends. Specify Jefferson-Union Renewable Fuses for your power and lighting circuits—they are carried for your convenience by electrical wholesalers everywhere . . . JEFFERSON ELECTRIC COMPANY, Bellwood, (Suburb of Chicago) Illinois. Canadian Factory: 60-64 Osler Ave., W. Toronto, Ontario.

JEFFERSON ELECTRIC



SOURCE The figures we use as basis for these monthly comparisons of performance in the electrical wholesaling field are collected and compiled by the Bureau of the Census of the U. S. Department of Commerce.

Business Index

For The Month of September, 1943

SALES For the second consecutive month, sales of electrical goods by wholesalers showed a gain in dollar volume over the previous month. September sales registered an increase of 2 points over August, which followed an August gain of 4 percent over July.

On the basis of those two months' performance it might be deducted that sales will follow the usual seasonal trend, increasing through the Fall months after somewhat of a slow-down in the early Summer period. Although we cannot expect the heavy increases in business that occurred in pre-war years when appliances and other consumer goods were available for Christmas buying, it seems likely that that sales increase should continue to show on the index for the next few months.

The lack of the above-mentioned consumer goods is more apparent in the comparison of September sales volume with the average monthly sales of 1939. This year September sales registered at 131 percent of the 1939 average, and although this represents a substantially healthy business condition, it is 3 points behind the figure reported in August.

INVENTORIES Continuing its slow but encouraging upward climb, the inventories index of electrical wholesalers' stocks showed a 1 point better condition in September as compared with August. However, as was evident in the sales analysis, a comparison with a peacetime year, as represented in the 1939 average of sales and inventories, shows the results of a diminished or extinguished supply of goods for the Christmas buying season. The inventories of wholesalers in September registered at 68 percent of the 1939 average, a decline of 4 points from the August position.

COLLECTIONS Collections throughout the country were reported at an average of 76 percent, 1 point behind the average registered in the previous month, and 6 points ahead of the average for September, 1942. Accounts receivable were 2 percent behind the previous month and 31 percent less than for the same month a year ago.

1230 Sixth Avenue • Rockefeller Center • New York 20, N. Y.

UNITED STATES

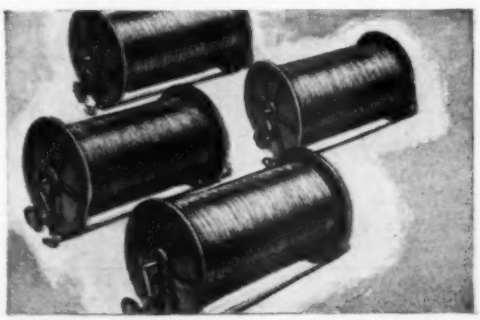
Miles from nowhere —but the message gets through

He'd crawled, run, crawled again. Now he was far ahead of his company... into enemy territory... surrounded... cut off completely from American forces except for a strand of lightweight wire... Laytex Assault Wire.

But his messages got through surely and clearly... made possible a successful advance.

Laytex Assault Wire is made expressly for jobs like this. It's extremely lightweight... yet tough enough to be used by advance scouts.

The use of such lightweight small diameter wire is possible only because the insulation is of such high quality—has high resistance to moisture, withstands a wide range of temperature changes and does not become embrittled when subjected to vibration and shock. Laytex Assault Wire has a talking distance of over five miles.



LIGHTWEIGHT Laytex Assault Wire weighs only thirty pounds per mile. This means that an advance scout can carry ample wire while pushing ahead.

SPECIALLY DEVELOPED for front line service, Laytex Assault Wire is hard at work in Europe, Asia, the South Pacific.

LAYTEX ASSAULT WIRE is unaffected by moisture or temperature changes because of the high quality of the insulation. This means it can be laid and used successfully regardless of climate or terrain.

FIVE MILES LONG—but messages get through clearly. Laytex Assault Wire, tested and retested for quality, has a proven talking distance of more than five miles.

S RUBBER COMPANY

WHOLESALER'S SALESMAN BUSINESS INDEX

REGIONAL ANALYSIS

SEPTEMBER, 1943

CONSIDERABLE variation in the distribution of wholesalers' sales among the nine geographical regions is evident in the September reports. However, in most cases, these variations are explainable and fit logically into an overall pattern of the trend in wholesalers' sales.

If we note first the several regions which represent the industrialized war-production areas, we find that they have reported sales volumes all about the same percentage above the August levels. This indication of a fairly well stabilized industrial market for electrical supplies is even more evident when it is noted that the August index showed approximately the same balance among these regions. The exceptions were: in September, the New England States at 89 percent of August; region 3, which fell down in August with sales reported at 5 points below the national figure.

The groups of states which usually are considered as non-industrial, presented a completely different picture in the September reports, but as the reasons are quite obvious, the situation does not seem to warrant alarm.

Regions 6, 7 and 8 showed declines from the August sales level. However, as two of these regions, nos. 6 and 8, had reported abnormally high sales gains in August over July, it is logical that even a normal sales volume in September would suffer when compared with the unusually high August figures. Consequently, region 6 reported sales at 83 percent of August, and region 8 registered at 84 percent. Region 7 held some of its sizeable August gain by holding to 99 percent of that figure in September.

Figures in this table apply to the geographic divisions as outlined and numbered in red ink on map above

SALES September, 1943 Compared in % with		Trading Region (See Map)	INVENTORIES September, 1943 Compared in % with	
August 1943	September 1942		August 1943	September 1942
89	80	1	102	64
106	87	2	101	60
105	69	3	96	60
107	80	4	95	60
102	72	5	94	64
83	61	6	101	61
99	69	7	112	64
84	58	8	98	61
102	71	9	96	77
102	**75**	For **U. S. A.**	**98**	**64**

The distribution of electrical goods from manufacturers to wholesalers in September was quite evenly balanced among the nine regions. All groups of states reported inventories that were within 3 points of the national figure, except region 7.

The latter, comprised of the West South Central states, registered its inventory volume at 112 percent of the August level, an unusual position for these states which have been maintaining an inventory level almost consistent with the national average since April.

News Notes From N.E.W.A.

By Alfred Byers, *Secretary*
National Electrical Wholesalers Association

N.E.W.A. ROSTER KEEPS GROWING

This year of 1943 will close with a great many more members on the N.E.W.A. rolls than when the year began. Managing Director Pyle, who took office just a year ago this month, brought impetus to the association's work among the unaffiliated electrical wholesalers throughout the country. There has been a discernible revival of interest in association affairs on the part of the membership at large. This has been reflected in their own successful efforts, locally, to induce neighboring electrical wholesalers to join N.E.W.A.

The Executive Committee, during its meeting in New York the latter part of October, elected eight applicants to membership. At this writing, only a few weeks later, about an equal number of additional applications are pending; and several more are expected to be filed before this page is in print. An important fact about this growth is that it is well distributed among the nation's chief trading areas.

SECOND N.E.W.A. POST-WAR FORUM

Another forum session is now being arranged for next month by N.E.W.A.'s Post-War Planning Committee. The first forum was held late last August and has, since then, been given extraordinarily wide publicity. It was so completely successful that the second forum is expected to provide considerable worth while data for N.E.W.A. members to apply to their own individual post-war preparations.

Mr. Metz, the Post-War Planning Committee's chairman; Mr. E. B. Ingraham, the chairman of the Committee's Appliance Sub-Committee; and their respective member associates, Messrs. L. E. Latham, R. Beller, R. J. Brown, and C. S. Powell, are arranging some constructive features for the forthcoming forum session. N.E.W.A. members will be hearing more about this forum in the near future.

INDUSTRY'S ADVISORY COMMITTEE

Announcement already has been made of the meeting of the Electrical Wholesale Distributors' Industry Advisory Committee to be held at Washington on December 9, 1943.

As a result of developments in the electrical appliance and electronics fields, Mr. Pyle planned to recommend to the Committee the appointment of an Advisory Committee for appliances and electronic devices.

N.E.W.A. MEMBERS RECEIVE SPECIAL PAPERS ON MERCHANDISING

Two special papers on post-war merchandising developments, have been sent to all N.E.W.A. members by Chairman Ingraham of the Appliance Sub-Committee of the Post-War Planning Committee.

One of these was a specially prepared booklet—"Trade Diversion," published by the New York Council on Retail Trade Diversion. The Committee believed that all N.E.W.A. members have more than an academic interest in that problem and would be aided by reading that booklet.

"Post-War Planning for Gasoline Stations" is the subject of the second paper, prepared especially for N.E.W.A. members by the Appliance Sub-Committee. These are the first two, in a series, of reports on post-war problems being expressly prepared for distribution among N.E.W.A. members very soon.

IF YOU'RE IN N.E.W.A. YOU'RE IN THE KNOW

Among the matters given special attention by N.E.W.A. at Washington lately has been CMP Regulation 9, the copper wire order written for civilian repair needs. Discussion of the same order by the Electrical Wholesale Distributors' Industry Advisory Committee at its last meeting resulted in the appointment of a special task committee to make specific recommendations to WPB for improving the value of that order.

Representatives of N.E.W.A. conferred with officials in the Wholesale and Retail Trade Division, and in the Copper Division of WPB. Inequalities in certain of the order's provisions were pointed out to these officials and discussed at length with them.

One important factor was disclosed during these discussions. The armed services are not at all pleased with the prospect of wire mills being hampered in any way at this particular time in meeting war production requirements. CMP Regulation 9 seems to hold that possibility in the opinion of some in the armed services.

With that point of view frankly placed before them, the N.E.W.A. representatives felt that the matter should be left in the hands of the Industry's Advisory Committee which, in the final analysis, is responsible for placing the views of the industry before WPB. After all, N.E.W.A.—first and foremost—is for aiding our armed services in winning the war.

WHY LAMPS?

Every single one of your customers uses lamps. Fluorescent lamps are expanding the market by leaps and bounds — creating new volume and profit opportunities for you.

WHY CHAMPION LAMPS?

Lamps are *demand* items but Champion Lamps are *profit* items. The Champion sales policy is fitted to your needs, puts your salesmen in a favorable competitive position, assures volume at a profit.

WHY NOT NOW?

The Champion name and what it stands for is being presented to every worth while customer and prospect in your territory every month. Why not get the story on Champion sales and profit possibilities as it applies to *your* business and *your* territory *now*.

CHAMPION LAMP WORKS
LYNN . . . MASSACHUSETTS

Champion controlled quality is the result of forty-one years devoted to the manufacture of the finest lamps that skill, experience and complete facilities can produce. Licensed under General Electric incandescent and electric discharge lamp patents they are subject to the industry's most rigid quality and performance standards.

SINCE 1900

CHAMPION

CHAMPION LAMP WORKS
Lynn, Massachusetts
A DIVISION OF CONSOLIDATED ELECTRIC LAMP CO

WHOLESALER'S SALESMAN NEWS

NEMA Studies 1944 Program, Kebler Succeeds McGraw

Only closed sessions held at New York annual meeting. Postwar planning, regulations, specifications studied at special meetings

A STUDY of the association's war-time program of activities for 1944 highlighted the October annual meeting of the National Electrical Manufacturers Association. Limited to closed sessions because of wartime conditions, the members devoted their week at New York's Waldorf-Astoria Hotel to division, section, group and committee meetings, plus several special meetings devoted to study of pertinent subjects such as wartime electrical production, government orders, specifications, regulations and post-war planning.

Missing as a war-time casualty was the open luncheon at which members and guests in the past have entertained and heard personages of importance to the electrical and allied fields.

At the concluding meeting members of the association elected Leonard Kebler to be president of NEMA for the coming year. Mr. Kebler is president of the Ward Leonard Electric Co., Mount Vernon, N. Y. He succeeds Max McGraw, president of the McGraw Electric Co., Chicago, Ill.

Five vice-presidents were elected: V. R. Despard, vice-president, Pass and Seymour, Syracuse, N. Y.; C. R. D'Olive, manager, household appliance division, Stewart-Warner Corp. Indianapolis; C. W. Higbee, manager, wire and cable department, United States Rubber Co., New York; D. G.

NEW PRESIDENT of NEMA, Leonard Kebler, right, receives congratulations of his predecessor, Max McGraw. Mr. Kebler is president of the Ward Leonard Electric Co., Mount Vernon, N. Y. Mr. McGraw is president of the McGraw Electric Co., Chicago.

NEW NEMA OFFICERS committee of the National Electrical Manufacturers Association poses for its first official photograph. Left to right: E. O. Sheve, General Electric; W. E. Sprackling, Anaconda Wire & Cable; V. R. Despard, Pass & Seymour; F. T. Wheeler, Trumbull Electric; Miss Henpinstall, secretary to W. J. Donald, managing director, N.E.M.A.; Leonard Kebler, Ward Leonard, new president of N.E.M.A.; C. W. Higbee, U. S. Rubber; A. C. Streamer, Westinghouse; G. C. Thomas, Jr., Thomas & Betts; Max McGraw, McGraw Electric; C. R. D'Olive, Stewart-Warner; (D. C. Phelps, Colts Patent Firearms, was absent).

FIFTY YEARS

OF QUALITY IN THE

MANUFACTURE OF

ELECTRICAL EQUIPMENT

FOR CIRCUIT PROTECTION

★ 1893-1943 ★

SHAWMUT IS

THE WORD

FOR FUSES

THE CHASE-SHAWMUT COMPANY

NEWBURYPORT, MASSACHUSETTS

Phelps, vice-president, Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.; and A. C. Streamer, vice-president, Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa.

F. T. Wheeler, vice-president, The Trumbull Electric Manufacturing Co., Plainville, Conn., was re-elected treasurer.

Albany Wholesaler Changes Firm Name

Because the officials had found that the name E S & E Co., Inc. had caused confusion, particularly among new customers and suppliers, it was decided to change the firm's name to "Henzel-Powers, Inc.," effective on November 1st.

The previous name was used originally to indicate the lengthy name of "The Electric Equipment and Supply Co., Inc.", which was that of one of the oldest electrical wholesalers in Albany, N. Y.

Gregory W. Henzel will continue as president, and Robert W. Powers will remain vice-president and treasurer. Both men have been connected with the original concern for more than 25 years.

The announcement of the change in name emphasized that no change was being made in the capital structure or in the company policies.

M. P. Nickerson New Wesco Supplies Head

M. P. Nickerson has been named general apparatus and supplies manager at the headquarters of the Westinghouse Electric Supply Company. He will have complete responsibility for the development, coordination, and promotion of apparatus business nationally.

Mr. Nickerson has been with Wesco since 1925, following five years experience with the Foster-MacDonald Co., electrical wholesalers in Boston. He later went to Cleveland as assistant sales manager, and then came to New York as assistant to the district manager. In 1937 he was placed in charge of syndicate business for the company, and later took charge of the marine fittings business.

Cold Cathode Standards Committee Announced

The personnel of a standards committee has been announced by the Fluorescent Lighting Association through its president, Victor H. Todd.

WHOLESALER'S new branch was established in Brooklyn, N. Y., recently by Harry Berken, president of the Central Queens Electric and Lighting Fixture Corporation who thereby became one of the few wholesalers to open a new house since Pearl Harbor. It is the third in a group operated by Berken on Long Island. At the top is a view of the new storefront with its impressive display of marine fittings and equipment, and below is an interior view on opening day showing some of the floral tributes.

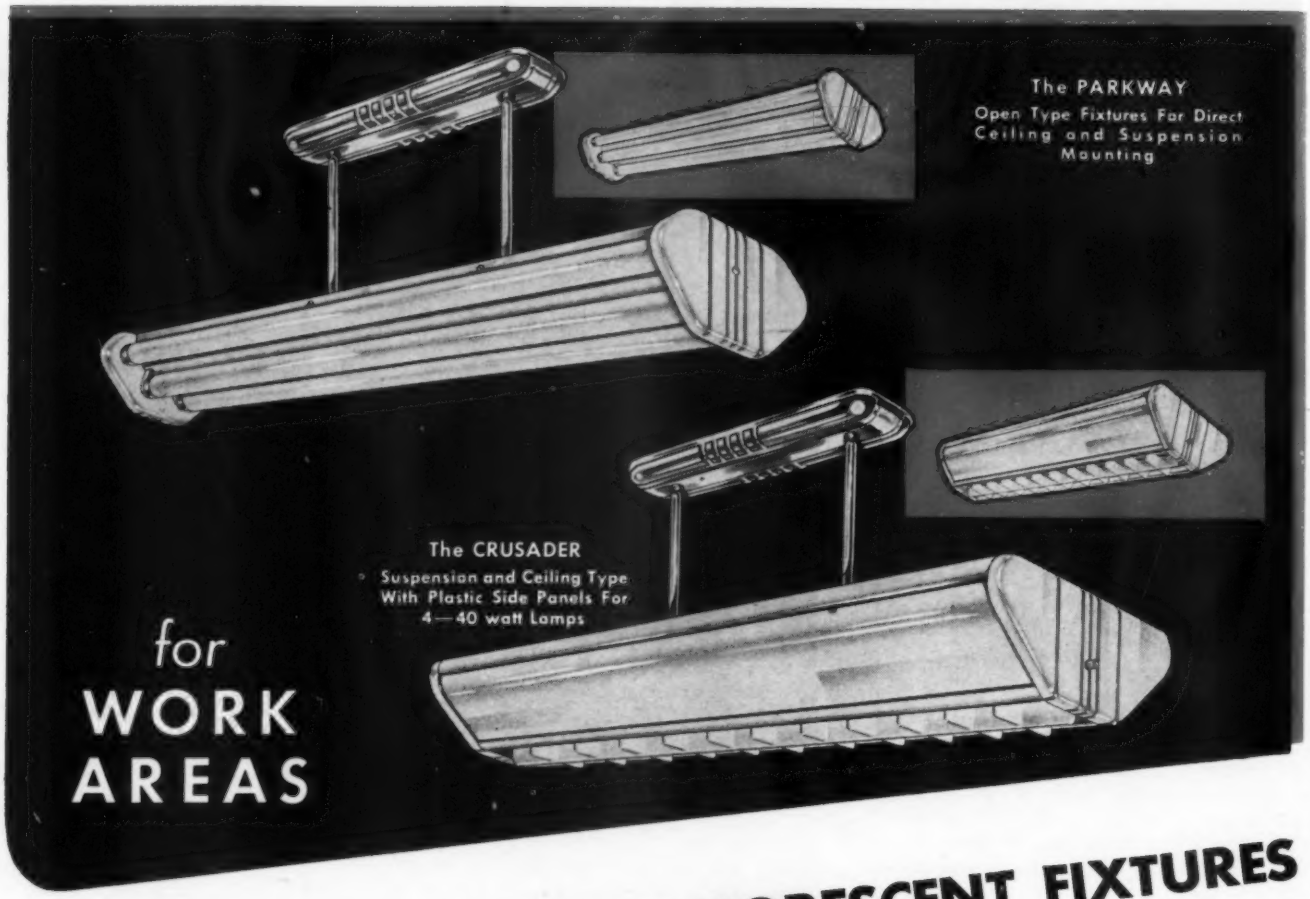
The committee has been formed, it was announced, in order to accelerate the association's efforts to establish more detailed standards covering products and installation practices for cold-cathode fluorescent lighting.

The newly-appointed members of the committee are: Charles A. Pollak, General Luminescent Corporation; John H. Mollica, Mobeco Inc.; John C. Sabatini, Colonial Lighting; L. C. Marschall, Sola Electric Company; Harry Weiss, Supro Lux Manufacturing Company.

Distributors to get Share of Radio Tubes

Plans whereby the present and future output of radio receiving tubes would be made available from manufacturers to distributors on an equitable basis and thus receive wider distribution among owners of household radio sets for maintenance and repair, were discussed at a recent

(*Continued on page* 85)


The PARKWAY
Open Type Fixtures For Direct Ceiling and Suspension Mounting
The CRUSADER
Suspension and Ceiling Type With Plastic Side Panels For 4—40 watt Lamps
for WORK AREAS

New DAY-BRITE FLUORESCENT FIXTURES

IDEAL for installation in all War-plant and Governmental work areas, these four new Day-Brite fixtures combine numerous lighting and mechanical advantages . . . Substantial *steel* chassis finished with Day-Brite's exclusive "Super-white" baked enamel high-reflection surfaces. Bodies of the Crusader have die-formed stay-put diffuse *plastic* side panels. End plates finished in ivory enamel decorated in aluminum gray . . . *Hangers supplied complete* with bridge-type ceiling strap, swivel fittings, stamped canopy, all necessary lock nuts and fittings *ready for installation* . . . Call your Day-Brite engineering representative, for complete details on these newest fixtures, *now available on priority.*

DAY-BRITE LIGHTING, INCORPORATED
5428 Bulwer Avenue • St. Louis, Missouri

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The Sign of Quality
Look for this Label

Day Brite
Reg. U. S. Pat. Off.
LIGHTING FIXTURES

72

COMMERCIAL · INDUSTRIAL and SPECIAL DESIGNS *Nationally distributed through all leading electrical supply houses*

Free Enterprise

THE OPPORTUNITY AND OBLIGATION TO COMPETE

☆

WE can be prosperous beyond our dreams—all of us—workers, farmers, and business men—but one of the prerequisites is the self-discipline of accepting competition for ourselves as well as others.

* * *

Free enterprise does not imply the freedom to use any or all means to make a profit. It does not mean the right to monopolize. ***It means the opportunity and obligation to compete.***

Competition requires ***independence of action, free access to the market,*** and ***no large degree of control over the price*** by any buyer or seller. In general, the larger the number of sellers and the more easily buyers can shift from one seller to another, the higher will be the degree of competition (and vice versa for buyers).

But let us not get too academic or go off the deep end. We cannot have perfect competition. We cannot subdivide businesses and labor unions into tiny units to make a multitude of buyers and sellers in each market; we cannot reduce our rich variety of products to a few rigidly standardized items; we cannot educate people to judge quality precisely; we cannot eliminate the costs of bridging space between buyers and sellers. On the other hand, have we gone as far as is practical and desirable in these directions?

We cannot even have a system of highly "sensitive" prices, that is, prices which fluctuate immediately in response to every minor change in demand and supply. This would occur in the dream world of competition-to-the-nth-degree. It cannot occur in the real world, or even in the ideal world of competition best suited to physical facts and human qualities. The economies of large-scale enterprise, the need for adapting products to human wants, the costs of transportation and the costs of issuing and acquiring market information put severe limits on price sensitivity.

Economists tell us that if prices were extremely sensitive, business booms and depressions would be much less severe—provided our stock of money remained fairly constant. But with the somewhat limited degree of sensitivity which is practicable in the economy, price and wage changes cannot prevent severe declines in business activity. ***We cannot count on competition alone to cure depressions.*** We must look mainly to other kinds of measures to prevent mass unemployment of men and machines.

If we cannot have prices which fluctuate with every small change in demand and supply conditions, we can work toward—and achieve, if we really want it—a system in which prices and wages are at least roughly responsive to long-run changes in demand and supply, a system in which most markets are not dominated by individual businesses, groups of businesses, labor unions, or farm organizations, and in which prices and wages are maintained at levels consistent with free access to markets and to jobs.

In any kind of an economic system there must be some means of determining prices, wages, and profits, and of bringing labor and capital into employment in the industry and place where they are most needed. There are two ways to do this: by administrative fiat or by the impersonal processes of the market. The first of these is typical of the totalitarian state; it frequently involves destruction of individual freedom or fumbling mismanagement. During the war all of us have had some experience with patronizing and paternalistic treatment by the state; we have found out what it means to be pushed around by bureaucrats; and we have discovered that the political determination of prices, wages, and profits leads to chaos when self-interest supersedes the fine fever of patriotism—as it eventually does. I do not mean to imply that we can do without controls over prices, production, and distribution in time of war; but I do suggest that we can learn something from their operation. Even with a united national purpose these controls work badly when human abilities are inadequate for the superhuman task, when personal or departmental jealousies crop up among officials, and when pressure groups try to prey on the rest of the public. Every day more Americans are beginning to understand why our forefathers feared the caprice and tyranny of power.

The impersonal processes of the market in determining prices and wages and in allocating productive resources will, in normal times, save us from the fumbling of bureaucrats and from the Babel of confusion, un-

certainty, and annoyance produced by their regulations. But these market processes will not save us from paying toll to those who monopolize and restrict entry to markets or jobs.

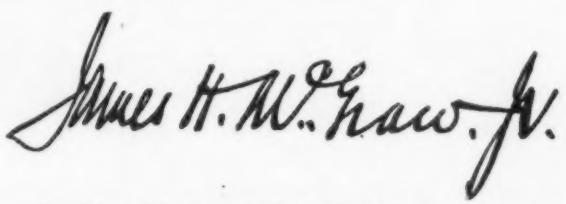
If we want an economy in which we are free to try out new ideas, develop new products, and introduce more efficient methods of production, if we want an economy in which there are great opportunities for men of imagination, inventiveness and energy, if we want an economy wide open to progress, then we must have a free field and fair competition for all comers—without collusion as to prices, markets, or production. This is the only basis on which we have a right to demand freedom from governmental regulation for ourselves and on which we can combat monopolistic tendencies in other quarters.

Let us stand squarely for the principles of the anti-trust laws and against all collusion and combination in restraint of trade. Let us insist that the government review with a critical eye every combination and consolidation which might restrict competition. Let us face frankly the problems of economic power arising out of price leadership and encourage every honest effort to find means to deal with them. Let us not shrink from questions as to whether some great aggregations of plants are too large for efficiency, free entry into the industry, and a free price. While we resist the efforts of the Department of Justice to extend the anti-trust laws by far-fetched and distorted interpretation, and while we fight every attempt to use them as a tool of persecution, let us cooperate in sincere efforts to modernize these laws and extend them by specific legislation to monopolistic practices they cannot now reach. I do not have a simple formula for this, but I believe we must try to find one.

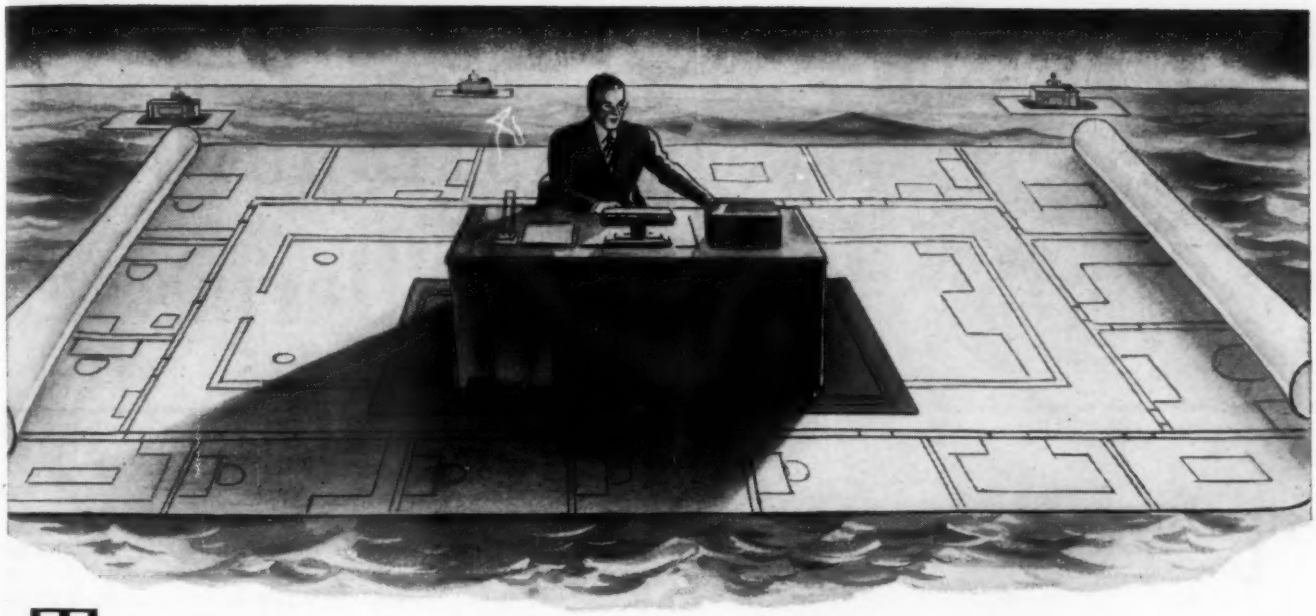
We can then, better face the problem of the growing monopoly in labor which is threatening to make the free enterprise system unworkable. Today labor is going through a stage of empire building reminiscent in some ways of a similar stage in business three-quarters of a century ago. Witness the same buccaneering spirit, the same concentration on selfish interests, and the same disregard for the public welfare. Business leaders learned the hard way that the public will eventually rise up against those who prey upon them. Will our labor leaders be wiser? The right to collective bargaining to protect the weak position of the individual employee is one thing—but the grant of unlimited monopoly privilege to combine into a private government which can dictate its own terms to businesses, industries, communities, and even to the government itself, and which can start a wage-price spiral such as to hinder the war effort and make full prosperity impossible in time of peace is something quite different. We need to find a middle way which will prevent employers from exploiting employees but which does not sow the dragon's teeth. The exercise of arbitrary power by labor threatens not only business, but also all workers outside the unions and all those dependent on pensions and savings for their existence, and ultimately, of course, the well being of union workers themselves.

The idea that the labor problem can be solved if great, powerful organizations of employers will sit down with great, powerful organizations of labor is a delusion. If our experience in the N.R.A. and in the war teaches us anything, it is that the best that can be expected in the long run from such a situation is an armed truce with intermittent civil war. And every truce would be a monopolistic arrangement to take advantage of those not members of the great organized groups. Business and labor unions, whenever confronted with postwar readjustments that are unfavorable to them will be sorely tempted to protect their own special interests at the expense of the public. There will be efforts on the part of businesses, abetted by labor unions, to limit productive capacity, to raise tariffs, to obtain subsidies, and to maintain prices at artificially high levels. The unions will oppose labor saving changes and will seek higher wages even in areas and industries of surplus labor. Already demands are emerging for direct joint action by business, labor, and agriculture to solve the transition problems of special concern to them. While these groups should have every opportunity to register their own self-interest, we cannot entrust our fate to decisions made by pressure groups. If experience is any guide, such coalitions will be almost certain to restrict opportunities for progress and expansion, to exploit the public, and ultimately to injure even the businesses, workers, and farmers included in them. We cannot afford a postwar N.R.A. Resort to temporary government regulation in the transition from war to peace may, however, be necessary in cases of great hardship.

We can be prosperous beyond our dreams—all of us—workers, farmers, and business men—but one of the prerequisites is the self-discipline of accepting competition for ourselves as well as others.



President, McGraw-Hill Publishing Company, Inc.



WEBSTER ELECTRIC Teletalk WILL RESCUE EXECUTIVES *Marooned* ON A FLOOR PLAN

New profits are waiting for the alert wholesaler's salesman in rescuing the many busy executives who are marooned on a floor plan . . . as high and dry as on a desert island so far as quick intercommunication with their associates is concerned.

Now is the time for you to tell them about Teletalk Amplified Intercommunication . . . the modern miracle that saves the day in so many office and factory layouts.

Teletalk is the most modern system of intercommunication on the market today. It expedites the securing of information . . . permits the holding of conferences without any of the conferees leaving his desk . . . breaks through all the barriers of walls and space in three seconds.

Teletalk Amplified Intercommunication Systems may be obtained in just the size to fit the demands of any organization . . . are easy to install, operate directly from the light circuit.

In these war-busy days, Teletalk Amplified Intercommunication Systems almost sell themselves. All that is necessary is to point out how it will save those lost minutes spent hunting for individuals, expedite information, avoid confusion.

Investigate the profit building features of Teletalk today. You will find it a most profitable asset to your business. Write us for full information.

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Electronic intercommunication, paging and sound distribution systems for offices, stores, factories, buildings, institutions, homes and farms.

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DALLAS

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WEBSTER ELECTRIC

"Where Quality is a Responsibility and Fair Dealing an Obligation"

Speaking of Post War Selling

The DISTRIBUTOR.... During and

"DISTRIBUTION" is a word that really encompasses the channel through which merchandise flows from the maker to the user. To cover that subject would take considerably more time than has been allotted to me, and also would presuppose considerably more information and background than I possess. For the purposes of this short talk I will consider "distribution" to mean the wholesale or distributing function which is being efficiently, effectively and economically performed today by hundreds of organizations in many different industries.

Inasmuch as my thirty years in business have been devoted to the distribution of electrical equipment I must, therefore, narrow my talk to cover the distribution of electrical supplies and appliances. Basically, however, our business doesn't differ materially from that of other distributors. As a matter of fact, I think it can be said that it typifies better than any other our American system of distribution just as the electrical industry by and large represents a cross-section of all American industry.

It is interesting in this connection to note that there is no electrical section of WPB. There is a steel section, a copper section, etc. The reason there is no electrical section is that in the electrical industry there are represented over fifty other industries from steel to lumber.

It is further interesting, and much to the point, to note that in the electrical industry the wholesaler is the generally accepted channel through which equipment and merchandise flow from manufacturer to user. Inasmuch as the electrical industry in general, and the electrical distributor in particular are so representative he can be properly used as an example of "distribution," as I intend to use him. With that as a background, let's proceed.

I have before me a copy of a recent issue of the Post-War Digest, in which there appears a very interesting paragraph under the following heading—"Changing Distribution Picture." Let me quote from this paragraph—"World of Tomorrow will dawn on a new American distributing system for consumer goods with every effort being made by manufacturers to reduce drastically the high cost of selling, now sometimes as much as 60 percent of consumer's dollar."

To one who has been in the business of distribution for any period of years this has a familiar ring, and starts him buckling on his armor, for most distributors know that with the hue and cry to "reduce drastically the high cost of selling" everybody starts pointing a menacing finger toward the distributor better known as "The Middle-Man." For he is the villian in the play—"The Whipping Boy of Business."

As long as I have been in business I have heard of the problem of the middle-man. Men who were old when I joined this Company thirty years ago told me during by educational process that all of their lives in business the problem of distribution was always the problem of the middle-man, and I assume their fathers and grandfathers before them went through the same thing. I imagine, too, that my children and theirs will be making talks, better than this I hope, to your children and grandchildren at future marketing meetings, all to the point that when better channels for distribution are built, the wholesaler will build them.

If we examine this problem of distribution or wholesaling, there are a few basic and simple facts that we should consider.

1. In the economic scheme of things we, of necessity, have a manufacturer who makes and a customer who buys merchandise. That merchandise must be taken from the man who makes to the man who buys. No matter what you do, what you call it, how you do it or how you call it, the different functions involved in that procedure must be taken care of, and those are the functions that we distributors are specialists in performing. You can put it down in the Book that whether we as independent entities do it, or whether the manufacturer does it himself, the functions must be in the picture. Insofar as consumer goods are concerned, the cost of those goods to the public could be reduced if the dear public didn't want and demand so much service. A quart of milk, for instance, would cost Mr. & Mrs. Jones very much less than they now pay for it if they had a cow in their garage. This is a perfect example of manu-

After the War*

By Herbert Metz

General Lamp and Lighting Sales Manager
Graybar Electric Company, Inc.

facturer direct to the consumer. Mr. & Mrs. Jones don't want to have a cow in their garage. They want to get up in the morning and find their milk in a nice shiny glass quart bottle, sterilized and with a fancy petticoat tied around its top with a sign swearing that the milk in it was pasteurized and bottled yesterday. That sort of thing costs money and epitomizes what the public wants. Unless I misjudge the American public, that is what it is going to continue to want, and get.

2. I mentioned before "you can put it down in the Book that whether we, as independent entities, do it or whether the manufacturer does it himself, the distributing *functions* must be in the picture." Talking won't justify any system of distribution, and I am not so fatuous as to think that anything I say here will be very long remembered or materially helpful in justifying our present form of wholesale distribution. That system has survived because it is economically sound and for no other reason. We in Graybar, and may I say we have been in business for almost seventy-five years, rest our case on one simple premise. We believe that our business is sound because we take the manufacturer's goods and deliver them to the customer cheaper, better and easier than the manufacturer can do it either himself or through any other channel. When the time comes when merchandise can be taken more economically from maker to user than we now do it, we will either have to change our system or get into another business.

3. A system of distributors or wholesalers is absolutely necessary to provide a channel through which a manufacturer producing a new product outside his field can get that product quickly and cheaply to its market. For instance, let's assume that the Laboratory of a Chemical Company develops an electrical gadget as a by-product. That product being electrical must be directed to a market which is neither contacted by nor familiar to the chemical manufacturer. Today, by virtue of a well organized system of distribution made up of electrical wholesalers, this manufacturer can have this product in the hands of those for whom it was designed in a matter of days. What would the chemical manufacturer do if there was no such system of distribution—electrical or non-electrical?

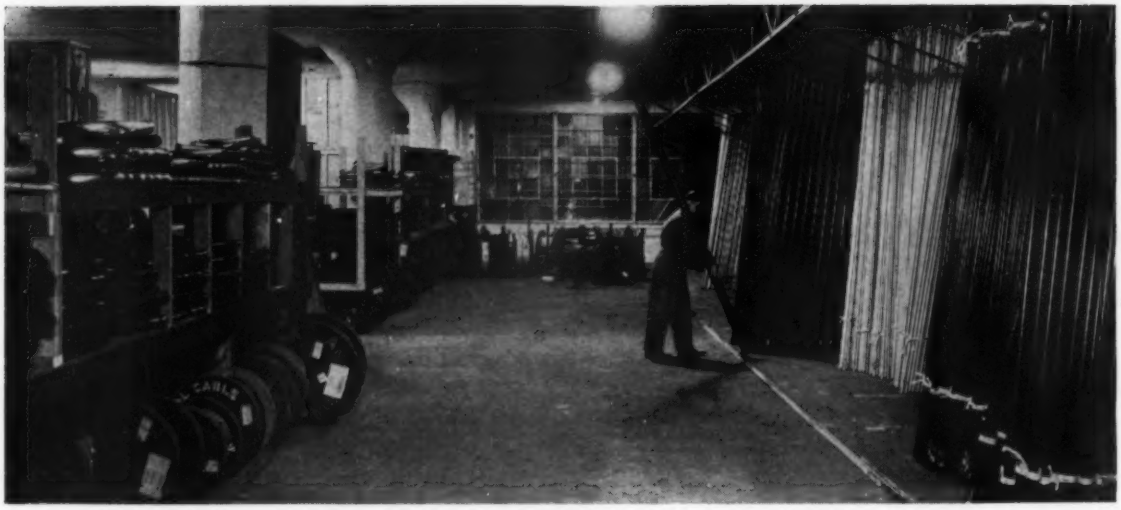
4. One of the very practical proofs that the distributor is performing a necessary function is found in the fact that he is so very healthy and his life expectancy so high. Come good times or bad, hell or highwater, the wholesaler like little Charlie McCarthy keeps "buzzing right along." I indicated above that we have been in business seventy-five years. Some of those wholesale distributors have been better than others, some have been pretty rocky, but we like to think of ourselves as a virile going concern today just as we were in 1869. What is true of Graybar is true of other electrical wholesalers.

In this connection, I have been doing a little private investigating, the results of which are more than interesting. The McGraw-Hill Publishing Company publishes an annual directory in which are listed all of the accredited electrical wholesalers in America. Taking 1931 as a base, I find that there were 984 electrical wholesalers listed as doing business in this Country at that time. In 1943, twelve years later, 588 of these same electrical wholesalers, or 60 percent, were still in business.

I have also checked the membership roll of the National Electrical Wholesalers Association. According to their records, of the 358 companies who were members in 1931, 322 or 90 percent are still active both in business and the Association. A very interesting and significant record. In passing, let me point out that according to figures I have received from McGraw-Hill, 88 percent of all business concerns pass out every five years. The record of electrical wholesaling indicates that on average only 25 percent passed out in twelve years. It is interesting, too, to note also that while there were 984 electrical wholesalers listed in 1931, there were 1,386 listed in 1942.

In this connection, I also want to point out that in 1931, there were electrical wholesalers in 264 American cities. In 1942 there were electrical wholesalers in 457 cities. The interesting thing here is that the electrical wholesaling industry is not only static but that it is very active and alert in following the growth of the industry and of America, making it possible for the manufacturer to have outlets in all strategic marketing centers as those centers develop.

Let's then take a minute to look at the wholesaler and the function he is performing in wartimes. To give you a direct picture of the wholesaler in times of stress like these, I should like to use the Graybar Company as an example. The reason for this is, of course, that I am so close to the Graybar picture and further that after all we are typical of thousands of other distributors not only in the electrical



but in the plumbing, hardware, steel and other industries.

In order to have definite records, or what is popularly known as Case Histories of our present function, we recently made studies of our business at each one of our eighty-five distributing houses, following orders from their inception to their completion. We took 171 out of thousands of examples and printed them in a leaflet which has been made part of a folder which we have prepared entitled "Streamlined for War." I would like to cite one or two examples which will give you a very direct and, I hope, interesting picture of what a wholesaler does in time of war.

At an important Cartridge Manufacturing Plant, all cartridge loading machines had been equipped with safety devices except in one important spot. This required a solenoid device but obviously one which was explosion proof and none were on the market. Supplying first, creative engineering ability and second, the ability to get several manufacturers to make parts of the whole, Graybar-St. Louis did that job and on March 1st, this device became available for every ordnance plant in the U. S. It will save time and very possibly, save the lives of many skilled workers.

The Ozark Telephone Company were asked to complete in forty days; one mile of underground telephone cable, a complete outside telephone distributing plant, switchboard and central office telephone equipment including batteries and all accessory equipment. This rush job was for an Army Airfield in the South. Ordinarily it would have taken three or four months to assemble the needed material, not counting installation time. Answering the emergency, Graybar-St. Louis had most of the material on the site within ten days and kept the rest coming so that no time was lost in installation. The job was done on time.

We, like other wholesalers, act as a contact for the manufacturers with the users of their material who are our customers. We have hundreds of salesmen across the Country who are today acting as contact men with thousands of industrial customers. We can do a contact job of this kind that the average manufacturer could ill-afford even if he had the available manpower, because our salesmen are not handling one product or representing one manufacturer, rather they are selling 60,000 electrical products manufactured by some 200 to 300 manufacturers. So, these salesmen of ours today call on these users of electrical equipment across the Country, be they large or be they small, maintaining the identity of the manufacturer, by taking to these customers the manufacturer's story of his product. What is even more important, these salesmen bring back to the manufacturer the customer's story and keep him posted on field conditions, giving him valuable suggestions regarding his product and his market.

Then, too, we wholesalers are performing a function by and large we have never had to perform before. It is a very important function in so far as the manufacturer is concerned. We have today a new problem. It is called "allocation." There isn't enough merchandise to go around, and so the consumers and dealers across the Country must be told that instead of the 100 units they are demanding we can let them have only three. Imagine the problem the average manufacturer of consumers goods would have if it were necessary for him to directly allocate his merchandise to thousands of big and little dealers across the Country. Imagine the correspondence he would have, but beyond that imagine the tremendous amount of ill will that would be heaped upon his shoulders. Today he has a very simple problem. He tells his wholesaler how much merchandise he may have, and from that point on it is the wholesaler's function to do the dirty work. The wholesaler, in other words, takes the allocation monkey right off the manufacturer's back, and perches is squarely on his own broad shoulders. I could cite many interesting examples that we in Graybar perform in this direction if time were available, but you can believe me when I tell you it is quite a job. So much of a job in fact that the U. S. Department of Commerce has issued quite a sizable booklet entitled "Distribution of Scarce Goods—Wartime Practices in Allocating Goods to Retailers." If you have any interest in this problem, and I imagine you must have, I suggest that you get a copy of this booklet.

Then there is the problem of transportation and deliveries. You know what this problem is, and you know how acute it is. It is becoming more serious each day. It isn't hard to understand what a very important function the wholesaler performs in this direction. The manufacturer makes one shipment to the wholesaler who breaks up that shipment into smaller units for local distribution. Imagine the problem that would be faced today by the transportation companies, the manufacturers and their customers if all merchandise were flowing both in small and large quantities directly from the manufacturer to the consumer.

Business today is also faced with the sales contact problem, the credit problem, the service problem and the manpower problem, each of which is important, each of which becomes daily more complicated, and each of which is being efficiently and effectively handled by the wholesaler for the manufacturer in a way that would be found impossible, were the manufacturer to attempt doing it directly.

Then, may I add that all these functions are performed on a margin of profit so low that the overall cost

cannot be matched by any other existing distributing system. As I have indicated before, economics dictates this cost, and economics in the future as in the past, will determine whether or not the wholesaling function shall be a continuing one.

At this point I would like to take the time to introduce what I consider incontrovertible evidence from typical war plants over the Country regarding the value that they place on the services of the wholesalers who supply them. Recently a questionnaire was sent by an independent research organization to 529 typical war plants located in 25 different cities across the Country. These plants are producing machine tools, airplanes, engines, ships, explosives, etc. Some are large, some are medium, some are small. The questionnaire asked three questions. It is interesting and quite significant I think that 165 busy war-time executives took the time and made the effort to fill in the answers to these three questions and sent them in. This is about 30 percent return which I am sure you will all agree is extremely high. I will read you the three questions and give you the answers—

Question No. 1.—Is it an advantage to have a wholesaler in your local territory?

The answers were all in the affirmative.

Question No. 2.—Does it simplify your purchasing to draw from one single source many products?

158 said "yes."
1 said "no."
1 did not answer this question.

Question No. 3—Do you feel that in the long run your saving in time and effort offsets the nominal fee charged by the wholesaler?

151 said "yes."
7 said "no."
7 did not answer.

It surely can't be happenstance that practically every one of these executives, who ranged from President to Engineer, went on record to the effect that the wholesaler renders a very important service to them. I am confident that the results of this questionnaire are typical of those that would be received were all industry canvassed.

And now, a word about the future. I want to assure you that we as wholesalers are looking ahead. We in Graybar are actively studying ways and means of meeting post-war problems. The National Electrical Wholesalers Association has a Post-War Planning Committee through which we, as individual companies, and as an association, are trying to look ahead and plan for the future. We are studying markets. We are trying to find remedies for old evils which are in our industry as they are in all industries. We are studying ways to more intelligently select and train our employees. We are looking for new things to sell—new markets to develop. We are getting ready for new industries as well as new devices. We are studying methods and checking and rechecking the physical layout of our offices and our warehouses. We are keeping records of our employees in the Services, in order to be as sure as we humanly can that our boys and girls when they come back are placed quickly and effectively. We are trying to cooperate with every movement that has as its objective the development of post-war business and the efficient distribution of merchandise.

Up to now I have very largely referred to the wholesaler, using Graybar as an example, as a distributor of electrical supplies and associated equipment used primarily in industry. There is another important phase of the electrical wholesaling business which covers the distribution of electrical appliances—washers, vacuum cleaners, etc., which are sold by and large through stores operated by dealers. It is around this appliance business that most of the arguments and discussions regarding distribution in the electrical field are now taking place. We hear considerable talk today about the wild scramble being made by so many manufacturers to get into this electrical appliance business, and the succeeding wilder scramble for distribution. We hear prophecies of new and interesting sales schemes through which merchandise will be taken directly to the consumer at costs fantastically low. We hear a lot about the Super-Duper Service Station in the post-war period where you will drive in at one end with an empty tank and a full pocketbook, and drive out the other end with a full tank, an empty pocketbook, and with the back seat full of gadgets from refrigerators to rat traps. I understand that the old type Service Station with its friendly pumps and even more friendly Jim and Joe are doomed. I don't think so! We Americans like size and efficiency to be sure—we also like personalized service.

It is strange isn't it, or is it, that despite the growth of the chain store idea the corner drugstore and the neighborhood grocer are still going strong. The small specialty shop run by Susie Smith still is a flourishing institution. I mentioned the grocery store. I have a friend who is very close to the food situation. He tells me that the wholesale grocer who was doomed to extinction thirty years ago when the grocery chains really started to grow is, like the electrical distributor, still a very virile, active and lively institution. Following is a quotation from a letter I received from this gentleman in reply to a query that I had previously addressed to him—

"Notwithstanding the vicissitudes encountered by the wholesale grocer during the past fifteen years, he seems either to have retained or regained his position. Those who have gone out of business through liquidation or consolidation appear to have been replaced in numbers and I think also in volume by newcomers in the field and by general growth in volume. The reasons appear to be, first, that the retail grocer, the neighborhood store, with its service, is needed and wanted by the public and that store, in turn, needs the wholesaler; second, that the wholesaler renders services to the manufacturer, to the retailer and through him to the consumer that must be performed by someone, whether it be manufacturer, mail order house, chain store, peddler or pushcart, and experience has repeatedly demonstrated that the wholesaler, serving many manufacturers, can do the job more cheaply and efficiently than any one else. In short, the functions of distribution are essential to our economy. If the wholesale grocer goes out of business, the job he performs must be taken over by some one."

I am not so fatuous as to think that there will be no changes in manufacturing, in retailing and in wholesaling post-war, but I do believe that whether it be electrical equipment, washing machines, vacuum cleaners, or tires, that merchandise must be taken from the man who makes to the man who uses or sells. This means, in essence, that a distributing function must be performed no matter under what name you might term it. I believe further, that the efficient, alert and active distributor or wholesaler will continue to be as he is today, the channel through which the bulk of that merchandise will continue to flow, more effective in some years than in others but continuing on, ever striving to be more efficient as the years go on.

In conclusion, let me say that the employees of Graybar own their Company, the largest of its kind in the Country. These employees for the most part have the bulk of their life's savings in this business. Some of them are young and some of them are older men and women who have grown gray in the service of Graybar and the business of distribution. Most of them are wise, few of them are gamblers. The fact that they have their savings in this business and have no idea of taking them out is most conclusive proof that they have faith in it as an important cog in the business machine today and unlimited faith in its future.

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* *An address delivered before the American Marketing Association at Cleveland, Ohio, on November 12th by Mr. Herbert Metz.*

Speaking of Post War Selling

You Can Sell Plant For More War- And

By F. D. Wilson*

Salesmen can help boost production, reduce fatigue in war industry by promoting sales of plant broadcasting systems. At the same time they will be preparing for peace-time commercial and industrial markets

MANY a salesman of electrical equipment has found an exceedingly fertile field in the promotion of plant broadcasting equipment. Some have started as radical skeptics as to the value of industrial music, but have found in the first tentative calls that the industrial executive needs little convincing—is in fact well read on the subject and thoroughly convinced of its value from many angles.

Often he finds that the average personnel director is considerably ahead of him in his belief that the correct music program, properly timed and played for his workers, will not only relieve fatigue, and make work more enjoyable, but will definitely increase production by 5 to 10 percent.

Do you realize what a powerful selling tool an honest increase of 5 to 10 percent with a constant payroll actually is?

The theory of work music is not new, in fact its origin probably cannot be definitely determined, but during the past couple of years, a great deal of research has been done on the subject and some startling results have been obtained. Much has been written, based on facts and theory, and executives and personnel men have followed these articles.

Executives of most large industrials realize that good equipment is available for transmitting music to workers throughout the entire plant, even in the huge war plants of today. That equipment is commonly referred to as factory voice paging but more accurately called plant broadcasting system of which type, that is probably the world's largest system, covering almost 5,000,000 square feet of factory area, was recently installed in one of the plants of the Wright Aeronautical Corporation.

Originally manufacturers aware of the discussions pro and con on the value of music, were quite skeptical. Some executives said "it sounds silly to say that music can increase production."

Today however there are production lines working on war contracts, which thanks to music are turning out more hundreds and thousands of identical items day after day.

To make a conclusive test, it is only necessary to find a production line where the jobs are tedious to

Having the employees take a hand in selecting the programs adds to their interest in the industrial music programs. At a New Jersey worsted mill these girls are placing their request in the "request boxes."

* *Sales Manager*
Commercial Sound Division
Operadio Manufacturing Co.

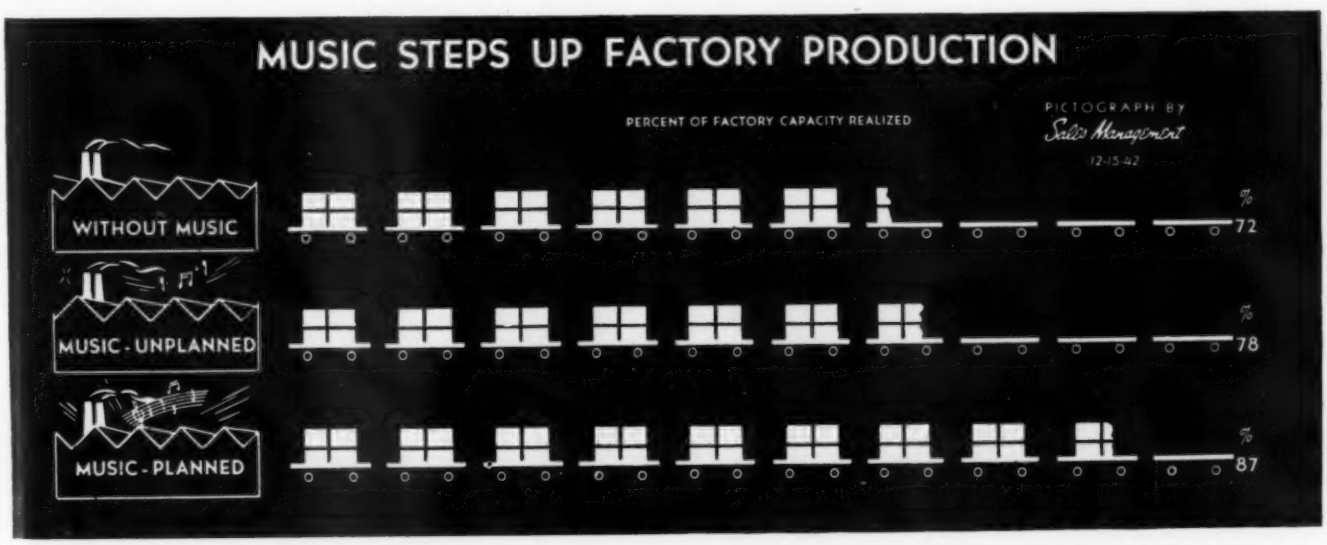
Broadcasting Systems Peace-Time Production

the Nth degree and where boredom and fatigue are very considerable factors affecting this type of production, because those conditions provide an ideal setting for a thoroughly accurate test.

For instance, in a certain plant a production line was building and wiring special control boxes. This line had been balanced by careful selection of highly skilled employees and had reached a high level of production. It had, in fact, been running for months before the test began and had maintained an identical average production each week for six weeks before music was played. Executives were extremely skeptical that music could help THIS line, as it had reached its apparent peak long ago.

The chart reproduced herewith shows the result obtained from the

Whistling while she works. Relief from the monotony of long hours at a coil-winding machine is given to this war-worker through music from the company's plant broadcasting system. The reproducer may be seen in the background. Photo from RCA-Victor.



As important as the music itself is the element of program planning, according to this survey by Russell Sanner of the Ohio Music Corp. (Muzak) and reported in Variety. Pictograph chart by courtesy of "Sales Management" magazine.

WPB Survey Finds Music Has Increased Production in 57 Percent of Plants. Morale Up In 87 Percent

Selected music in high-geared war industries lifts workers' morale, reduces fatigue and is a definite aid to production, according to an extensive survey of 100 war plants, undertaken for the War Production Drive headquarters by Wheeler Beckett, well-known conductor and composer. Beckett reported to WPB that planned industrial music is universally liked by the worker and, once given a fair trial, was equally liked by management.

In his nationwide tour Beckett learned that 76 of the 100 plants offered music by phonograph records. Improved morale was claimed by 87 percent of these, while 57 percent expressed belief music increased production.

The survey also shows that 50 percent of the public address installations in the 76 plants were made after July, 1942, and declared this indicated a new development in the American industrial scene. Throughout the country there are over 1000 leading war plants with broadcasting systems, according to a survey made by the Industrial and Sound Department of the Radio Corporation of America.

The principal value of industrial music in relation to efficiency, the WPB survey declared on the strength of its findings, is not in speeding up the worker to greater efforts, but in relaxing unnecessary tensions and creating a pleasant atmosphere for work.

Mr. Beckett also found an apparent relationship between the length of the music programs provided in factories and the claims of improved morale and increased production. Improved morale was reported by all of the 39 plants using more than one hour of music per shift, while 66 percent of this group claimed related increases of 5 to 10 percent in production.

Other findings of the report are that music can be used as successfully in noisy departments as in quiet departments; that workers should be given some choice in the selection of music and should not be permitted to gain the impression they are part of a musical "experiment"; that plant broadcasting has incalculable value for uses other than music—such as paging, announcements, air raid alarms, talks by visiting war heroes, and radio broadcasts of news and important speeches.

gradual introduction of music, with a careful analysis of reactions at each stage. It will be noted that at the start production averaged 145.15 percent of the rated output of each job, indicating that each employee was earning a bonus of 45.15 percent in addition to his wages. Thus the average efficiency was already at the highest rate it had been possible to attain by any known efficiency applications.

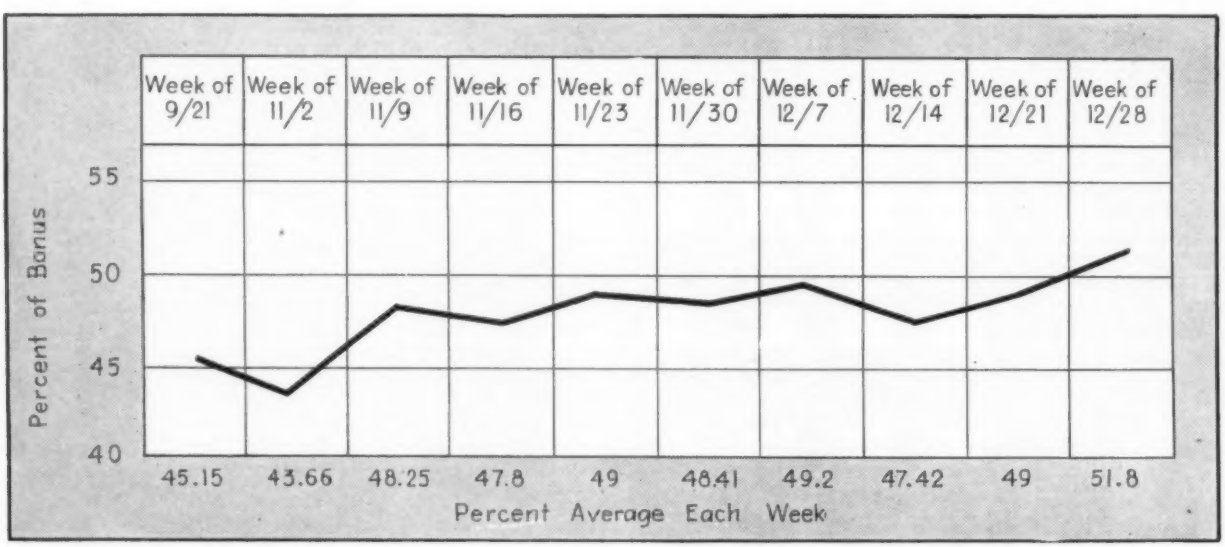
An increase of 6.6 percent was ultimately reached, with what was already the most highly efficient group in the plant!

At the same time rejects dropped from 3 percent to as low as 0.5 percent. Rejects, of course, are mistakes, and many mistakes or accidents are caused by fatigue.

Following tests of this type made in various plants, several manufacturers have designed a standardized, or "package" plant broadcasting system, which incorporates all the essential broadcast quality components. Such a unit offers the wholesaler an opportunity to present a "ready made" quotation because it comes ready to plug in and it is simply necessary to add the required speakers. This means that with little or no technical knowledge, the distributor's salesman is today enabled to present a completely engineered job, which previously had to be figured by factory engineers.

A typical unit will operate 20 to 40 loudspeakers and has a full 125 watts of audio output power at less than 5 percent distortion. Generally additional amplifiers can be added to handle a larger factory, or a later addition to the factory.

To assist in quoting and selling, this "package" system, survey tables are available in which the approximate square footage that can be satisfactorily covered by a given speaker in a given noise level, is



A production line that was believed to be operating at its peak reacted as above to the effect of well-organized music programs. Based on the percentage of efficiency bonus earned by employees, it is equivalent to total work turned out.

outlined. To facilitate sales effort these definitions are given in layman's language, and it is only necessary to use common sense to estimate the cost of a complete "plant broadcasting" system.

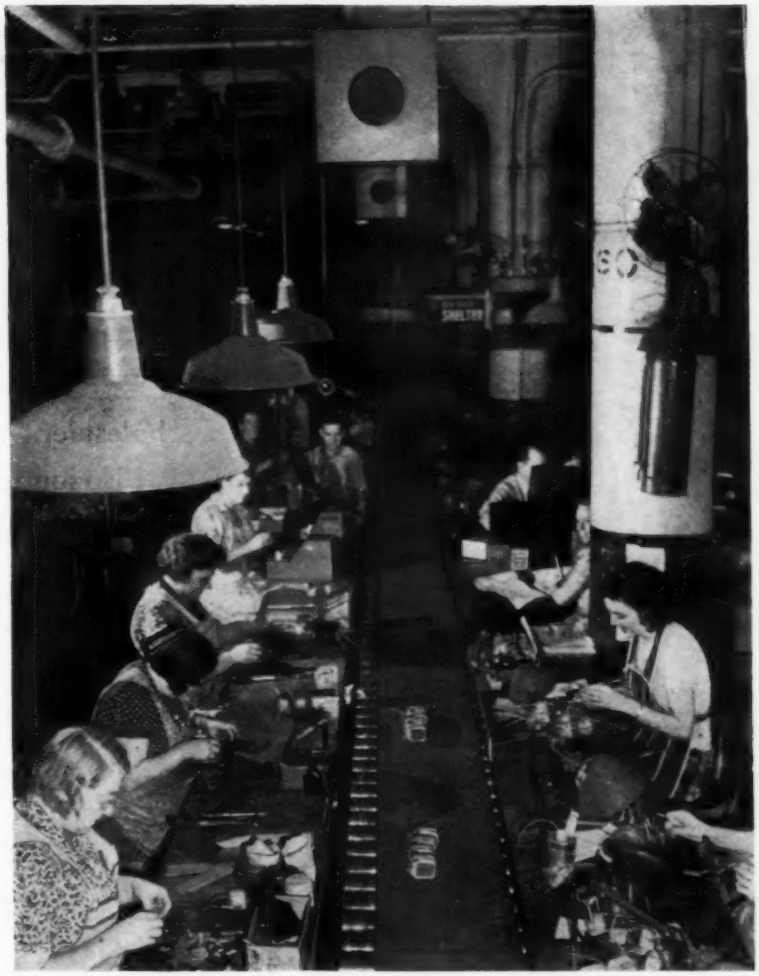
For the present, of course, sales of such equipment must be confined to war plants or vital industries who will be granted the necessary priority. The War Production Board recognizes the great value of a plant broadcasting system and has repeatedly granted priority for such installations. The fact is that the factory sound system has come into widespread use during the present war effort. Besides music it is also used for voice paging and *anyone anywhere* in the plant can be *instantly* called. It is often used for fire, air raid, and emergency signals. Instructions can be given to maintenance men, and help quickly summoned in the event of an emergency or an accident.

It is reasonable to expect that, with all its advantages being demonstrated in all-out production, civilian industry will also offer a huge market for "plant broadcasting" when materials are once more available. Greater output and greater coordination of plant management are attained, and, it is safe to guess that private industries will be just as quick to apply this stimulus to the benefit of their own payroll, as the war industries are now doing.

In peacetime a great variety of potential users will again be obvious prospects for this equipment. We have all heard sound and music systems in restaurants and clubs. Many of these are very poor, cheap installations, and it will be a relatively simple task to install a really good music distribution system in hotels, restaurants, clubs, depots, institutions, small and large factories, and shops in every conceivable business.

It is safe to assume that ten years hence leading concerns in every type of business enterprise will be supplying music to workers, in both office and factory, and that practically every spot where people gather will be equipped with a sound distribution system.

It will pay every wholesaler and salesman to fully investigate the potential business offered by plant broadcasting equipment. It offers interesting sales possibilities.



These war-workers on a small parts assembly line, find work easier because of the morale-building effect of the industrial music program which the manufacturer supplies. Wholesalers' salesmen who help industrialists speed their war production program through the use of these plant broadcasting systems are preparing the way for a large post-war business among those commercial and industrial establishments which do not have preference ratings today. Photo from RCA-Victor.

Typical plant broadcasting system equipment. This system combines a phonograph, public address system, microphone recorder, radio recorder, and radio. Photograph from Radiotone.

Speaking of Post War Selling

What's Ahead for Distribution*

So long as wholesalers survive as active and economical agencies of our distribution system, their future and fortune is affected by many factors not directly under their control

IN the capacity of chairman of the National Association of Manufactures' Sub-Committee on post-war distribution, I have had the opportunity to sit in on a number of discussions of this subject with a group of men who represent quite a cross-section of American industry. This Committee has prepared a memorandum for consideration by the N.A.M. Board of Directors, and while at this time the Board has not yet accepted the report, I feel at liberty to give you some of the thinking of the Committee.

First we were impressed with the immensity of the post-war challenge to marketing and distribution, meaning not only the movement and placement of goods but making possible their widest and fullest consumption as well.

Amidst all the uncertainties which will face American industry, "when the war is over," one fact stands out—this country can *produce* undreamed quantities of goods and services.

Seeing the tremendous flood of war material that is rolling out of the industrial plants of America, the American people have already begun to ask: "If we can turn out all these goods in wartime, why can't we do it in peacetime? If we can virtually wipe out unemployment and give a job to every man and woman in the land who is able and willing to work in *wartime*, why can't we do it in *peacetime?*"

Every thinking business man realizes that this is the fundamental problem that American industry faces after the war. But we must face another question that is equally important: Even if we can *produce* at an unrivalled rate, can we *distribute* this output?

That question still has to be answered, and that question constitutes the post-war challenge to our distributive mechanism. We have proved that our economy can produce, but we have not proven that it can *distribute* the output effectively enough to maintain high employment and make the attainment of a higher standard of living an actuality instead of a dream.

First, let's look at the size of the job that faces distribution. Taking the FRB Index of production as a measure, our physical output of goods is now running at the rate of 85 percent above that of 1939, 63 percent above that of 1940, and 8 percent above that of 1929, and in the post-war years *should* certainly be substantially above that of pre-war years.

Another way of expressing the size of the distribution job is that: Roughly speaking, about one-half of the total output of American industry is going to *military* uses. At the same time, despite certain *shortages*, chiefly durable consumers goods and gasoline, the

* *Excerpts from an address by Howard E. Blood, President, Norge Division of Borg-Warner Corporation, before the Chicago Federated Advertising Club, Oct. 28, 1943*

By Howard E. Blood

civilian economy has so far been contracted only a fraction below what it was in *1942*, and not much, if any, below what it was in 1941.

Today, under the cataclysmic influence of war, we have "full employment." Though the economists and statisticians may disagree as to the precise definition of "full employment," there is general acceptance of the idea that it means an economy in which any person who is able and willing to work can find employment without too great delay, in making goods or providing services for which there is a market, i.e., which some one else is able and willing to buy.

But today about half the output of our industrial machine is composed of goods and services which civilians do not want and will not buy when the shooting stops. What then, come peace, should our factories turn out for which there will be a market, i.e., for which our people will be willing to work in order to have the money to buy?

Which Channels To Use

And by what methods and thru what channels should our goods be distributed so that they will be available to the greatest number of people at the lowest possible price?

That is a question concerning which production management will turn to distribution management for an answer. If distribution management *fails* to answer in terms of production requirements which provide relatively full employment for manufacturing employees, then the imperious demand of a politically powerful segment of the American people might be that *government* step in and direct industrial operations under the illusion that government ownership or control would provide work for all who want it.

The heart of the problem lies in the fact that today about half our manufacturing output is going to one customer—government. One customer—Uncle Sam—has decided what he wants, how much he wants, when he wants it, where he wants it, how it is to be packed and shipped, and what price he will pay for it. In effect, the Armed Forces are performing the basic marketing and distribution functions for *one-half* our total output.

But when demand for war production has largely ceased, what then? How will American industry decide best to utilize to the utmost these production facilities which have demonstrated ability to turn out nearly twice the physical pre-war volume?—It is the marketing and distribution managers of America in closest collaboration with production and research executives who must undertake to provide for manufacturing industry in peacetime the outlets which government has supplied during war.

The fact that the United States has achieved the highest standard of living of any country in the world due to the American free enterprise system is of course in large measure due to ingenuity in invention and production. It is perhaps not so generally recognized what an important part the American Distribution system has played in our extraordinary economic development.

New Inventions and new products would be of little value were it not for the advertising which, not only tells people of their availability, but stimulates desires not formerly in the people's consciousness because they have not known of the creation of things which would make their lives more comfortable, economical or enjoyable.

Many of the things in common use today would not have been so used had it not been for the enterprising door to door salesman who, in spite of rebuffs and resistance has finally come to get enough people to recognize the desirability of his products so that their sale has required less and less effort and less and less unit sales cost. In no other country are such a wide variety of products so generally displayed so that the people expect as a matter of course to find their favorite brand available at a moment's notice no matter where they may be.

Must Have Free System

The maintenance of our free distribution system is a vital and necessary part of our private enterprise system. Distribution has employed and will employ very large numbers of people and in the transition period after the war will be one of the most important means of transferring people from war work to peace time pursuits.

Without the maintenance of our distribution system it would be impossible for us to produce and sell the volume of goods essential to the maintenance of prosperity. The costs that experience has proven to be essential and the

employment of large numbers of people in distribution are vital parts of our economy.

Unit distribution costs have, however, in most cases gone down in proportion to reduction in manufacturing costs. Take for example refrigerators. The percentage cost of selling refrigerators has not varied much during the period in which the unit price has gone from $500.00 to less than $200.00. This means that the unit cost of distributing refrigerators has gone down in proportion to the reduction in manufacturing costs.

The main problem for American distribution is to make it more effective so that it will assure the distribution of large quantities of goods. The secondary problem is to make it more efficient so that unit distributive costs may be as low as possible resulting in lower selling prices and large volume consumption.

Any cataclysm such as the present one brings with it a great deal of disruption, and this has been very evident in the distribution of products.

It follows that such a period of forced disruption in itself affords the greatest opportunity for each company to consider whether post-war distribution should be conducted in the same way as its pre-war distribution. It may be many years before the manufacturing companies will have a comparable opportunity to consider whether sound distribution requires a reshaping of distribution methods—in other words, when changes could be affected with less need for breaking up an existing operation and personnel.

Many companies will no doubt properly conclude that in general their past methods should be continued, but even in such cases there will be many changes to personnel and improvements in sales planning, sales technique and sales training.

Consumer markets probably never will be *exactly* the same again. Industrial markets will be made over by the presence of many new elements. The distributing mechanisms no doubt will take advantage of the upset conditions to jettison bad practices and clumsy organizations which careful analysis may reveal.

Free Enterprise In Danger

Now I ask your attention to some major trends and developments that may affect post-war distribution and these trends would also affect those who make goods for ultimate consumers, those who make industrial goods, and those who purvey services.

For many years prior to the war, and especially during the 30's, there was a steady and disturbing trend toward political control of distributive activities,—political interference with the free movement of goods—which was reflected in the numerous laws, codes and regulations—Federal, State, and local—whose passage was secured by particular groups who sought "protection" against competition of one kind or another.

These laws were of three main types:

1st. State and local trade barriers, intended to protect enterprises within an area. Examples are State and local load limitations on trucks, State and local licenses restricting the work of salesmen, and local building regulations which restrict the inflow of "outside" materials even though cheaper.

2nd. Those that used tax powers to restrain competition. Notable examples were the chain store tax laws.

3rd. Those intended to preserve so-called "fair competition." The outstanding examples were the State Price Maintenance laws, and State Unfair Sales Acts which prohibited sales below "cost."

There is much reason to believe that the trend toward such laws, temporarily stalled because of war conditions, will be revived after the war. **Every such law, unless genuinely justified on the ground of public welfare, is a blow at free enterprise. One such law begets another, and in the end all business suffers from the paralyzing effect which such legislation has on distributive activities.** All such laws, in the long run, add to the cost of distribution, and it is the consumer who pays the bill. **They should be vigorously opposed by all who want to preserve free enterprise.**

Angles On Post-War Markets

The United States will probably continue to have large Army, Air and Naval forces after the war. The existence of such forces whose energies and whose purchasing powers will be diverted from ordinary civilian lines, is certain to affect both the production and distribution of goods through private channels. Under no circumstances should the government permit its own distribution agencies, conducted for the benefit of the members of the armed forces, to sell directly to private consumers.

Demobilization will be followed by the need for the government to dispose of *large quantities* of surplus goods; and such disposition may, if not properly regulated, swamp civilian markets, and disorganize for a long period the normal function of both the production and distribution of certain goods.

There has for some time been evident a steady trend toward average *older age* in the country's population. This may *reduce* the demand for some types of goods and *increase* that for others. The normal and war-induced shifts in population will also have a pronounced effect on markets and on the various distribution channels.

Total purchasing power will probably be greater than pre-war, especially in the low-income brackets, which will enjoy a higher percentage of total national income than before the war.

This will mean a greater production of semi-luxury items than before, with a corresponding increase in the importance of distributing outlets handling such semi-luxury items.

Other Post-War Trends

The following post-war trends should be looked for in the field of installment selling:—

A. During the last ten years the banking field as such, as against the national finance companies, has had a

taste of the consumer credit end of the business and the taste has been fairly good to them. Local banking institutions on the whole will offer plans for extending consumer credit in a very much larger way than they formerly did—local service as against a national service. There is no presently indicated tendency in the direction of additional national finance companies entering that field.

We may expect a large scale resumption of national financing of sales to consumers, with a large increase in local bank financing of local selling. Such competition might lower or hold down the cost of consumer financing.

b. We may expect government regulation of consumer financing, but this need not be government control, nor need it mean government re-entry into the field itself (as through the Electric Home and Farm Authority). The Federal Reserve Board may be expected to adopt regulation of the terms of installment credit, in an endeavor to reduce unsound expansion contributing to "boom" conditions and inflation.

c. We may expect an increasing practice by manufacturers and distributors of the financing for wholesale sales through finance companies.

d. Several manufacturers doing self-financing of consumer credit have already transferred their folios to finance companies, devoting their own efforts to selling customers instead of engaging in both selling and sales financing.

The demand for certain types of services (such as professional services, beauty parlors, recreational centers, hotels, and gas stations) will rise to higher levels than pre-war, with a consequent expansion of the outlets supplying such services.

The net trend will probably be toward larger average size of retail stores, but this will not mean either domination by the very "large" nor elimination of the "small" retail outlets. There will probably be a further and perhaps accelerated decentralization of shopping areas. An increase in the number of suburban branches operated by large metropolitan retail stores will probably take place.

Both the very large and very small localities tend to a declining percentage of total retail trade due to the increase in retailing in medium size towns. During 1929–1939 county seats have risen in importance. It is important to consider the extent to which air express may change both the retailing and servicing of products.

Distribution Costs X-Rayed

So far as the overall cost of distribution of goods and services is concerned we may expect to see an increasing portion of the national income spent for distribution and distribution services, as distinct from production. This will occur because the public, with higher total consumer buying power than in pre-war years, will demand a greater variety of goods and a greater number of services. For society as a whole such increased total payments for distribution and distribution services, when they result from public demand for variety of either goods or services, represent higher living standards.

This is not at all inconsistent with the fact that we may look for a steady decline in the unit cost of distributing many specific products, and in the distribution costs of many types of selling outlets.

The challenge presented to other trades by lowered costs in the retail chain grocery, drug and variety fields, probably will inspire greater efforts toward reduced operating expenses in many types of outlets.

There is a growing interest in attempts at cost reduction, even though it may mean a complete overhauling of established procedures. The relatively heavy expenses involved in stock control, transaction handling and other non-selling functions, probably will receive close attention.

Wholesalers Face Problems

The retail stores of the country by and large are becoming more and more dilapidated. The equipment is rapidly wearing out and getting out of date. It will probably get worse before the war ends. All of these points indicate that there will be a tremendous rush towards improvements in retailing and presumably in other distributive institutions as soon as the war is over. Wholesalers and retailers of consumer goods will be in a good position to modernize.

Existing small concerns will probably be able to borrow from the banks to meet their needs.

Consumer's cooperatives we believe will continue to grow; but for a long time to come, will probably not handle a significantly large proportion of consumers' purchases.

They may receive substantial financial support from labor organizations and other people who believe that changes in present systems of distribution may in some manner bring higher standards of living and greater ease of life.

Farm cooperatives both for the marketing of farm products and to a lesser degree for the purchase of farm supplies, have had a steady growth for many years, and there is every reason to believe that this growth will continue.

There will probably be closer integration between wholesaling and retailing functions, and perhaps integration between manufacturing and distributing functions.

In the immediate post-war rush to promote sales many manufacturers may seek to get into the retailing field much more than before—for example, paint, wall paper, home appliances, radio.

While this trend is likely to expand, experts in the field are rather skeptical about the long-term success of manufacturers going into the retailing field. Moreover, the trend will probably be limited by legislative restrictions if it goes very far.

In general, the tendency of manufacturers to go into direct consumer distribution will not be as marked as the tendency of wholesalers and retailers to integrate.

Changes in servicing methods are likely to occur. For example, one central "service" organization in a community might service several different makes of home appliances, instead of each distributor maintaining a separate service crew.

In conclusion may I say the skills and techniques of distribution have varying degrees of importance in different industries. In some they are the primary and principal factor of the business, while in others engineering and manufacturing technique are more important. In general, the cost of distribution is an important factor in the price of goods; and to the extent that unit cost of distribution can be lowered by improved methods, prices can be lowered and consumption increased. The total overall national cost of distribution may, however, be increased with greater consumption of goods.

There is, however, no magic route nor short-cut to radically lower distribution costs. The basic elements of distribution costs in the past are the necessary elements of distribution costs in the future and cannot be reduced by government decree nor interference.

Speaking of Post War Selling

Highlights of TOMORROW'S H

Now is not too soon for planning the type of lighting equipment that should be offered to the post-war home owner

PLANNING the lighting for tomorrow's home is not merely to excite the imagination nor solely to develop idle curiosity. Maintenance of employment and of production demands a readiness to make and sell postwar devices, certainly no later than the immediate cessation of hositilities and in many cases even before that.

Home making and modernization may rather be an easement over a considerable period of transition rather than some abrupt change like falling off a business precipice or being elevated into some seventh heaven of futuristic weirdness. We can profitably plan now,—possibly use some plans before the termination of the war, or at least test out our plans before we need to put them into practice. A laboratory model of a refrigerator or washer may have to run a couple of years on development test before anyone can feel sure that the customer can get the fullest value from it. Sometimes a new lamp must burn more than a year before its life and characteristics are known. Thus planning now is not a bit too early.

Old equipment has not shown overly much imagination. Perhaps the incentive of war-time materials and radically new devices for the battlefield will incite some different types of construction or at least widen the field for different materials,—glass, plastics, ply-wood and new metals.

New Homes Will Be a Big Market

Tomorrow's home lighting will probably begin with new equipment for the estimated one million new $6,000 class homes per year. If a rewiring scheme can be worked out without too much expense for the 50 per cent of our present residences that are more than 50 years old, then the modernization of at least half of our present homes would be the next step. Remember that half of our homes were wired before there were any electric refrigerators, ranges, washing machines, vacuum cleaners, or airconditioners.

Trend Is Toward Comfort Lighting

The tendency seems to be toward in-built or architectural lighting equipment and away from exposed bare lamp bulbs, this being made easier by the fluorescent lamp. Fluorescent lamps incidentally, are satisfactory today for work places in the home and after the war the resumption of production on softer colors more complimentary to the complexion will likely extend the fluorescent lamp into almost every part of the home, including curved shapes for floor portables, or baby sizes for luminous faced clocks, the telephone, the stairways, house numbers and all manner of ornaments. Miniature fluorescent lamps now classified as "war babies" such as used in the cockpits of bombers, special signals and markers will add to the variety for tomorrow's home services.

We may expect tomorrow's lighting levels to be raised because the citizen who has worked in the war factory under 50 footcandles of light will scarcely be content at home in the evening under 5 footcandles. Moreover when the industrial worker discovers that more than half of the employees, old and young, have defective vision, he will see to it that one of the large contributory factors to bad eyesight, namely bad home-lighting, is remedied.

Emphasis Should Be on Convenience

Lighting in tomorrow's home should be more flexible than today. This means a plurality of switches and circuits to give different intensities and different colors in many rooms, thus effecting what has been termed mood conditioning. Pictures on the wall may become luminous panels; television; ultra violet duplication of sunlight; or invisible radiant heat for bodily comfort will all be parts of the lighting system.

The heat lamp or infra-red drying lamp will probably graduate from the factory where it is now used to build airplanes and tanks, into the home where it will become a supplemental or spot-heater. Such heat lamps may be employed above the bed, flush with the floor, or built into a portable footstool for local comfort.

The germ-killing lamp is indicative of another home lighting adjunct because its peculiar kind of ultraviolet will reduce infectious diseases, help preserve foods, control odors, sterilize surface wounds and in general tend to make life longer as well as sweeter.

The cost of home lighting is probably not a consequential factor because the average residential light-

S HOME LIGHTING

Photo by Bachrach

By S. G. Hibben*

ing bill in the city is about $34 annually, while in the country the farmer with more appliances pays about $40 annually. Actually for about 10¢ per day, we get home electric service (including appliances) that is about the equivalent of having a horse work hard for about four hours each day. Most housewives in this servantless period know that it is no fun to work like a horse and there will be no difficulty in selling the idea of comfort-making and time-saving devices in tomorrow's homes.

Tomorrow's home lighting ought not to develop much, if any, higher lighting bill than today. If we do as well as we know how to do right now we could get about twice as much light for the same cost through the following means:

1—Larger sizes of copper wire which in many cases is over loaded and is soaking up 5 to 10 percent of the electricity uselessly.

2—Keep lamp bulbs, lamp shades, reflectors, and accessories really clean.

3—Think about the absorption of light in dark colors of paint and dark interior decorations.

4—Throw away the old blackened lamp bulbs which really have degenerated into electric heaters.

5—Buy and use only well established brands of bulbs, remembering that before Pearl Harbor there were among others, some 10,000,000 Japanese made lamps of inferior quality that were sold in this Country under some camouflage name.

6—Reduce the cost of lamp bulb renewals and enjoy gain in lamp efficiencies by replacing several smaller lamps wherever possible with one large one.

7—Buy and use lamps made and marked at the voltage which the electric light company supplies your home.

More Imagination Needed

We need more lighting imagination and good wiring not so many more lighting tools. The copper cobweb wiring standards of the Gay Nineties should no longer be acceptable if we think in terms of doubling the electric consumption every ten years. The lighting specialist today has nearly 5000 different kinds and types of tungsten filament lamps to choose from and tomorrow's lighting fixtures need no longer be limited to miniature suns imprisoned in glass bottles supported by imitation candles or writhing arms of brass, or small bathtubs hung from the ceiling by dog chains or reflectors that serve little purpose other than catching dead flies and falling dust. We know how to make America a gloriously electrified nation of homes, so it is not too soon to make up our minds that we are going to do it.

* *Director of Applied Lighting*
Westinghouse Lamp Division
Bloomfield, New Jersey

Speaking of Post War Selling

Markets After the War*

IN making plans for after the war any business enterprise is necessarily concerned with probable general business conditions at that time.

Fortunately an exact forecast is not essential. Since none of us has a crystal ball which will divulge the exact order of future developments, any such specific and detailed predictions are almost certain to be wrong. As in the past, plans will have to be made with sufficient flexibility to meet a range of business conditions.

What is needed is a better understanding of the impact of the war on the Nation's business and of the possibilities it creates for the immediate post-war period; more information on both the favorable and unfavorable factors as they are developing, and some appreciation of their effect on different industries. In short, there is need for a national perspective from which you can view your particular problems.

How Much Can We Produce?

Prominent business leaders and government officials are agreed that a high level of productive employment must be maintained after the war. Postponing for a moment the question of whether this objective can be attained, what business conditions would it create?

What would total business volume be, if most of the people who will want to work after the war, do have productive jobs? What sort of market would it create for your product?

One of the perspectives frequently lost by the man who is too close to the day to day problems of his business is that our country is still growing and at a fairly rapid rate. There were about 6 million more people either employed or actively seeking employment in 1940 than in 1929. The war is influencing this trend in a number of ways but the net permanent effect will be an extension of about the same rate of growth from the pre-war to the post-war period.

The productivity of these workers is also increasing. This results from improvements in techniques, greater use of labor-saving equipment and the shift of workers from less productive to more productive jobs. Even with the shorter hours in 1941, the output per employed person was roughly 25 percent greater than in 1929. There is every reason to expect this trend to continue after the war.

Prior to 1929 the growth of the Nation's output pretty well kept pace with the growth in its capacity to produce. This growth trend was obscured in the following decade by the worst depression this country has experienced since the last century. The Nation turned out more goods and services in 1940 than in any previous year. Yet of total available manpower (including only those civilians able and willing to work) only 46 million were employed and 9 million unemployed. (This compares with approximately 2 million unemployed in 1929 and 1 million today.) The volume of business had not expanded in line with the Nation's capacity to produce and its desire to consume.

The war is demonstrating that there really is this capacity to produce. By 1946, if the war is over, the potential will be 40 to 50 percent above actual production in 1940. This is in physical volume. If, as seems likely, the price level after the war is higher than that of 1940 the dollar volume of business could be greater.

This is an estimate of capacity, not a forecast. The inevitable dislocations caused by the war make production at full capacity in 1946 unlikely. At the other extreme a return to the 1940 volume of business is almost out of the question. Because of the further growth of available manpower and its productivity, such an output would leave substantially more unemployment than at the bottom of the last depression. Between these two extremes you will want to

**Address given before the Fifteenth Boston Conference on Distribution, Hotel Statler, Boston, Tuesday afternoon, October 19, 1943.*

By S. Morris Livingston, *Chief*
U. S. Bureau of Foreign and Domestic Commerce

make your plans for a range of general business conditions.

Markets for This Output

There are some physical limitations on the full utilization of this labor supply. In some fields the physical plant to turn out such a large volume of civilian goods does not now exist. In other fields the conversion of factories and manpower to civilian production and the adjustment to peace-time markets will take an appreciable length of time.

But the biggest question is how to sell such a large volume of goods at a profit. Where is the money coming from? What reason is there to suppose that business can be any more successful in creating an effective demand for a high level of production after the war than it was before? During the war business has demonstrated its ability to produce more than 150 percent of the 1940 output. This is possible because it has one customer with an insatiable demand. What reason is there to suppose that business can distribute an equally large volume of civilian goods?

The best reason is the impact of the war itself.

Two years ago it was generally assumed that there would be a major depression immediately after the war. Depressions always follow booms. We were headed for the biggest boom this country has ever had. Therefore a depression was inevitable. It was as simple as that.

This reasoning overlooked the fact that this is not that kind of a boom. As this war ends the consumer will have plenty of money in his pocket both in current income and in war savings. But his purchases of many types of goods will have been at depression levels.

For example, there were about 27 million passenger cars on the road at the end of 1941. If the war lasts another nine months, new cars will not be produced in quantity until 1945. By that time the normal mortality will reduce this inventory to less than 20 million cars. By the end of another two years there will be less than 16 million. The other 8 or 13 million may not actually be scrapped because of the impossibility of getting replacements. They will be candidates for replacements as soon as new cars are readily available. To make up this deficiency and at the same time take care of current replacements will require several years of production at a higher rate than has ever been achieved.

Deferred demand for a long list of durable goods is very important—but those of you who recall some of the wild calculations made back in 1932 will also agree that it can be a mirage. Deferred demand can be deferred indefinitely if people do not have money in their pockets or the confidence to spend it. We are back to the earlier question: Where is the money coming from?

The latent purchasing power of this high income can be illustrated by showing what could happen to the volume of residential construction if the present income per family is maintained.

The average family spends about one-fifth of its budget, after savings and taxes, for housing. There is considerable variation with individual families and quite a lag during periods of rapidly rising or falling incomes. But the average is remarkably consistent. Barring the sort of restrictions introduced during wartime it holds almost regardless of how large or small a family's income is.

There were 20 percent more nonfarm households in 1940 than in 1930. But income per family was still substantially below 1929 and people could not afford to pay as much for their housing. Census returns indicate there was a decline of 4.3 million in the number of households who could afford over $40 per month for their housing. There was an increase of 8.7 million in the number who could afford to pay as much as $40 per month.

This one fact explains what was wrong with the residential construction industry in the Thirties. Throughout the decade the aggregate supply of housing exceeded the demand over most of the price range where new construction could compete with existing dwellings. As a result the number of new dwellings constructed was substantially less than the increase in families. Obsolete and dilapidated structures were

not replaced because the demand for cheap housing exceeded the supply.

Today the average income per family equals or exceeds that in 1929. If this purchasing power is maintained after the war the conditions of the last decade could be exactly reversed. Millions of families would move up into an income class where they could afford new construction. Several millions of the most unsatisfactory dwellings would have no market. They would have to be replaced. The volume of new construction could considerably exceed the increase in population since 1940.

The outlook for residential construction depends, of course, on a great many other factors, notably what the construction industry does in the way of reducing costs and improving distribution processes. The only point I am making here is that if we do have a boom it will be due not so much to the curtailment of construction during the war as to the inherent desire of people to improve their living standards above the pre-war level and in line with their higher income.

Accumulated Buying Power

Whether deferred or otherwise effective demand depends on purchasing power. This leads us back again to the earlier question: Where is the money coming from?

Perhaps the most important factor affecting post-war as against pre-war business conditions is the enormous quantity of liquid spendable reserves accumulating in the hands of individuals as a result of war-time savings. "Something new has been added" which is too big to be overlooked by those who are formulating post-war plans. This force may be constructively favorable or it may be destructive in its violence.

Prior to 1941 individuals had never saved as much as 10 billion dollars in any one year. In 1942 they saved more than 25 billion dollars. Of that total about three and one-half billion dollars was used to retire installment debt. Another 3 to 4 billions went into equities in real estate, insurance and miscellaneous securities. About 20 billion dollars was added to individual holdings of currency, bank deposits and Federal Government bonds.

Total individual savings in 1943 will exceed 30 billion dollars. If the war lasts through 1944 the total for the three years 1942-1944 will be substantially larger than the total income of individuals in the best pre-war years.

In the three years ending December 31, 1943, individual holdings of currency, bank deposits and Government bonds will have increased roughly 60 billion dollars. The additions to the *individual* holdings of these liquid assets in the one year 1943 will be larger than the *individual* and *corporate* accumulations during the two-year period April 1917 to June 1919, including all of World War I.

These funds constitute a reserve out of which people will be able to buy things that have not been available during the war. Or to maintain their current consumption expenditures in spite of temporary unemployment. More important, however, is that they will enable the consumer to spend more of his current income after the war. He will have already accumulated his reserves against a rainy day.

Since the production of goods after the war will in large measure provide the wages and other income to pay for those goods the added buying power of these accumulated funds assumes very large proportions. The net expenditure of even a small part of these reserves in any one year will create a demand for all of the goods produced. The real danger is not that buying power in the immediate post-war period will be inadequate but that, because of this accumulated buying power, there will be a frantic attempt to buy more goods than can be produced, thereby causing inflation.

The major problem immediately after the war will not be to create purchasing power but to control it. The transition from war production to a high level of employment in the production of civilian goods presents serious difficulties, the solution of which will not be easy. But the threat of another depression of the 1932 variety immediately after the war is not one of them.

The Capital Goods Market

So far we have been talking about the demand for consumer goods. How about the capital goods market? The outlays for manufacturing plant and equipment in 1941 and 1942 were nearly as large as the total of the preceding ten years. Have we built most of the new facilities we will need for the decade following the war?

To answer these questions and to avoid having our perspective distorted by particular situations we need a picture of the whole capital goods market.

Of the total outlays on producers plans and equipment in the four years 1937 to 1940 only about one-third was in manufacturing and mining. The various public utilities plus agriculture made up another third and the balance was in retail and wholesale trade, the professions, and a host of service industries.

For the three years 1941 to 1943 the outlays in manufacturing and mining will be almost three times as large. There has been no such ex-

pansion in other fields which constituted two-thirds of the pre-war total. In fact their 1943 expenditures will be substantially below the pre-war average. These people are being told they will have to wait until after the war to buy many of the new facilities they need.

The same discrepancies exist within manufacturing. Those industries which provided most of the pre-war market for capital goods have been starved by the war. They include food, textiles, lumber, furniture, paper, printing, stone, clay and glass products and a number of other industries. Some of these war plants are readily convertible to civilian production at moderate cost. Many of them are not.

Don't forget that the present national output would have been impossible without the enormous outlays for new plant and equipment in war industries. Aside from the difficulty of converting these plants to civilian use, there are other reasons why this expansion will not be adequate to turn out an equally large volume of civilian goods. Multiple shift operations, long hours of overtime, and the overloading of inadequate and obsolete equipment are not likely to be any more popular or more practical after the war than before. In general, the physical plant of the country is being operated at considerably more than the optimum rate which would prevail if business were free to reduce costs by building new plants or buying additional equipment.

Of course war-time expansion will leave difficult situations for some lines of business. But don't write off the capital goods market as a total loss. It offers some interesting possibilities.

The Reconversion Period

So far we have indicated a potential volume of production far above any pre-war level.

The potential demand for that output exists in the form of (a) the deferred demand for goods not available during the war; (b) the desire of consumers to increase their scale of living in line with the higher incomes that go with full production; and, (c) the need for new plant and equipment in many fields in order to increase capacity and to lower costs.

The necessary buying power will exist in the high incomes which people will have at the end of the war supplemented by the enormous accumulation of savings which will help to tide them over the reconversion period and by accumulation of corporate reserves to be spent for reconversion.

There is not time to discuss the similar accumulation of demands in foreign markets which is another favorable influence. At this point you could call me an optimist. The whole picture is not quite so rosy.

The real danger is not another 1932 depression immediately after the war. The real danger is a peculiar combination of boom and depression. The maladjustments brought about by the war may leave business unprepared to produce in adequate quantity those goods which consumers will want. Thus certain industries and communities may have large numbers of unemployed while others have a demand for more than they can produce.

To the extent that there is unemployment because of bottlenecks in physical plant, because the marketing, engineering and organization problems of conversion to peacetime output have not been solved, because people are slow to move from depressed areas to communities where there are employment opportunities; the purchasing power of incomes created by full production will no longer exist.

The term reconversion as applied to these problems is misleading. The mere reconstruction of an automobile assembly-line, difficult as that may be, is a small part of the job.

About four-fifths of all the civilians now employed are still in civilian production or in war production so similar to pre-war civilian output that no serious plant reconversion is involved. This includes agriculture, the utilities, most retail and wholesale trade, a broad group of service industries, the manufacture of such items as food, clothing, fuel, steel, lumber and cement.

This does not mean that these industries do not face serious problems in developing markets for a greatly expanded production, in strengthening their production and sales organizations, and in preparing to meet changed conditions after the war. It does mean that those employed in these industries are not automatically thrown out of work when war production stops. Whether they continue to have employment depends largely on what happens to the other two-tenths of the Nation's manpower.

One of these tenths is in industries largely or wholly converted to war production. It includes automobiles, refrigerators and office equipment. This group faces all of the engineering problems in resuming production of civilian goods plus the marketing problems connected with rebuilding a sales organization.

The remaining tenth of the Nation's business contains the most serious reconversion problems. The output of a number of commodities such as airplanes, ships, and explosives has been expanded so greatly for war purposes that there is no reasonable possibility of finding

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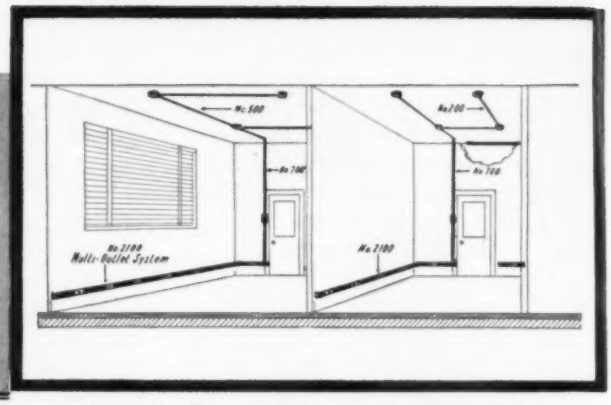
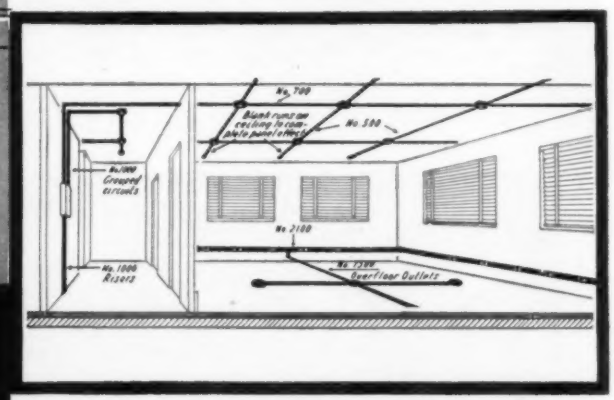
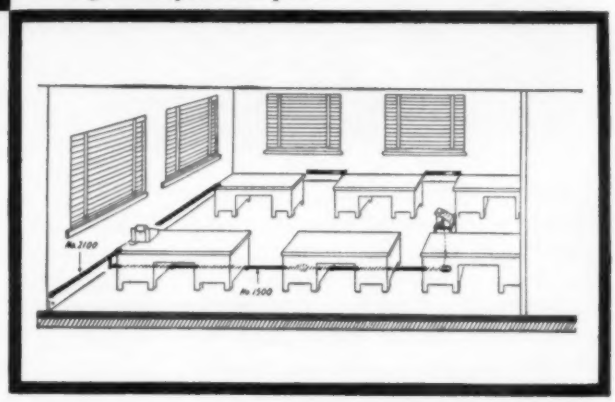
AND YOU KNOW THE ANSWERS



Typical small office, hospital or hotel room installations of WIREMOLD together with PLUGMOLD plug-in-anywhere convenience outlet system.



Installation in larger office or factory working area, showing use of WIREMOLD wiring for light, with PLUGMOLD around baseboards and PANCAKE overfloor wiring for telephones or power.



Installation in executive offices showing PLUGMOLD plug-in-anywhere convenience wiring interconnecting with PANCAKE overfloor wiring to office machines.

● Better lighting, in the factory, in offices, in trade and vocational schools . . . wherever essential productive work and training is being done...is one of the "musts" in the war production program. That entails wiring and rewiring problems that can most easily be solved with basic Wiremold Surface Metal Raceway Wiring Systems . . . quickly, economically installed on the surface . . . with few simple fittings . . . with minimum use of critical materials . . . without, in most cases, disturbing progress of work.

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PRODUCE FOR WAR . . . AND PLAN FOR PEACE

peace-time markets for more than a fraction of present production in the same or a closely related line of business.

If these companies are to maintain a large part of their present volume of business they must be prepared to go into fields which are relatively foreign to their present operations. The difficulties in the way of such a move are very great.

Fortunately a lot of people can be taken out of these war plants and put to work in the same communities in garages, restaurants, barber shops and laundries, providing services which people want but cannot get now. The danger is that these and many other civilian industries will not expand fast enough when the necessary manpower and materials are again available to them.

Since the return of men from the armed forces will be just about offset by the elimination of overtime, and of those civilians who probably will not want employment after the war, the problem centers around getting these two-tenths of the civilian manpower back in peace-time production before their unemployment can affect the market for other industries and thereby throw still others out of work.

Some unemployment in the transition period appears inevitable. Whether it can be held to manageable proportions depends on (a) the preparations by individual businesses to resume civilian production on an expanded scale as soon as possible; (b) the possibility that as the war progresses some steps toward reconversion can be taken before hostilities cease; and, (c) the purchasing power in the hands of consumers and the confidence to spend it.

In addition to the consumer's accumulation of liquid assets there are unemployment insurance, special payments to returning service men and certain other forms of relief for those who may be temporarily out of work. A reserve of useful public works can also be of some help provided the projects are ready to start at a moment's notice.

This aggregate of buying power is quite impressive. But it will be inadequate without the confidence of the consumer. If he is one of those thrown out of work he needs all of the assurance that can be given that there will be a job waiting for him when the reconversion process is completed.

Potential vs. Effective Demand

Even if you choose to take an optimistic view of the country's ability to solve these reconversion problems, there is no room for the attitude that the demand for goods after the war will be so great that selling will be no problem. The demoralizing effect of that attitude can ruin any sales organization.

In general, there is nothing automatic or inevitable about post-war markets. The market potential that goes with high income and accumulated buying power needs to be translated into effective demand for particular goods or services. If not, the goods will not be sold, people will not be employed and the high income will no longer exist.

A peace-time level of production which approaches the capacity of available manpower after the war means a substantial increase over pre-war standards of living. To reach this higher standard of living, people must be persuaded to buy more things than they ever had before.

Granting that human wants are inexhaustible there is also inertia to change. When the average family which used to have $1,000 income suddenly finds itself with $2,500 it does not automatically adjust its diet, housing and other expenditures in line with those families which had $2,500. Even before the war there were notorious examples of consumer groups who did not know what to do with an increase in income and, therefore, quit working full time.

This is a challenge to business enterprise. It calls for better marketing analysis, more imagination and ingenuity in developing new products or new markets for old ones, more strenuous efforts to improve promotion and distribution methods.

The New Mass Market

The increase in living standards does not mean a uniform increase over the pre-war volume of business with the same products sold through the same distribution channels to the same income groups. Entirely aside from new technological developments, such a large increase in consumer buying power would in itself create potential markets that would differ from pre-war conditions in many other respects than mere size. You need to understand how this affects your business.

There is no time here to more than hint at some of the possibilities. According to one study the average family with an income of $2,000 to $3,000 before the war spent about four times as much as the family with less than $1,000. It spent only two and one-half times as much for food but the expenditures in restaurants and other eating places went up fifteen to twenty times.

Expenditures on some other items, such as fuel, increased comparatively little at the higher income level but telephone and laundry service increased more than ten times. Expenditures on purchase and operation of automobiles were ten times as large.

Even as recently as 1940 about one-third of all the families and individual consumers in this country had incomes of less than $1,000. Eighty to ninety percent had incomes of less than $3,000.

This was the mass market. If mass production could not reduce the cost of an item so people within this income range could afford to buy in quantity then mass production was out of the question. This severely limited the possibilities for many businesses.

Today the people with incomes of less than $1,000 have become relatively unimportant as a market for goods. The mass market is in the $1,000 to $4,000 range. What possibilities would the continuation of this level open up for your business after the war?

In closing, I want to reemphasize the dominant importance of distribution problems. Reconversion is going to be difficult from any angle. But intelligent post-war planning requires first of all a thorough understanding of your market. It requires information on market potentials and marketing processes which frequently does not now exist. It means a great deal more time and effort spent on commercial research. The Department of Commerce can help but it is primarily up to you.

How Wholesalers and Electrical

To Help Win the War—

It's a four-lane highway with WPB, the electrical wholesaler, the electrical contractor and the electrical inspector — all working together in the same direction — that will carry us to maximum war production and sound peace time business

IT appears that ever since we entered into the shooting stage of this war, there is more and more demand for ships, planes, tanks, munitions of all kinds, and consequently a greater demand for all of our critical materials including copper. Then, when we consider that there are 2,000,000 pounds of copper in an airplane carrier or a battleship, that there are 2,000 pounds of copper in every plane, that we used over one billion pounds of copper last year in making shells and cartridges, when we consider that all our Allies depend almost entirely on us for their supply of copper, it is a wonder that we can supply all of our war requirements and still have something left for civilian use.

Although it may seem like a paradox, when we consider these conditions, the electrical wholesaler is in a better position today to deliver construction material to war industries and essential civilian requirements than he was a year ago, and—there is a reason for this.

At the outset of our war program, the powers that be in Washington decided that all supplies should be purchased from the manufacturer and that there was no place in the picture for the electrical wholesaler. They started out on this basis and very soon discovered that manufacturers were producing for orders only. They couldn't keep up with their orders; they couldn't accumulate a stock, and their deliveries on these urgent orders would be delayed for many months.

The electrical wholesaler stepped into the breach and made immediate deliveries to all of these essential war factories so that their work went on. This continued until there was a change of heart in Washington and the electrical wholesaler was recognized as a part of the picture. When the Controlled Materials Plan came into effect, the electrical wholesaler was classified as a part of it, as a warehouse to make immediate deliveries to these war industries.

Chicago is a hot spot in war production and the electrical wholesaler industry in Chicago has been recognized as an essential industry.

There has been a change of thinking, too, along other lines in Washington. Officials realize at the present time that the war program cannot be supported without a solid civilian economy. They realize that we can't win this war by burning down our own civilian buildings. In the early stages of this war program, you heard orators from the War Production Board and from other agencies who said "There isn't a pound of copper for civilians. If you have a dangerous condition in your home, shut off the light and burn candles. They were good enough for your grandfather and they're good enough for you."

In contrast with that attitude in the last year or so many Washington officials have changed their whole thinking to the effect that they fully realize that certain civilian requirements must be taken care of and consequently, rules and regulations have been modified according to this line of thinking.

There is a recent ruling, CMP-9, that went into effect just a few days ago. This provides that all retailers, repair men, electricians, can buy copper wire to the amount of $33.00 a month on their own certified order only, without further approval from the War Production Board. This will give these dealers a stock of wires and cords so that they can maintain the equipment in the home in a fairly safe condition.

I have heard it said that there isn't any lamp cord. There is more than you think there is, for the reason that lamp cord has been frozen in the wholesaler's stock. He was not permitted to deliver lamp cord unless he had the proper priorities. These retail dealers could give him no priority and consequently

Inspectors Can Cooperate and Build Peacetime Business*

By A. J. McGivern *Managing Director, Chicago Electrical Wholesalers Association*

his stock was frozen. This new order will release that lamp cord for sale and you will be surprised how freely you will find it on dealers' counters in the near future.

There is another spot where the War Production Board has cut red tape and simplified matters a great deal.

Order CMP-5 gives what you might call automatic priorities to all business concerns, giving them the right, within the limitations specified, to extend their order without further priorities and obtain everything that they need in the electrical line with the exception of controlled materials. Now, the wholesaler's stock of rubber-covered wire or copper wire is the only item of controlled materials they carry or sell.

This Order CMP-5 lists manufacturers of war products; those listed in Schedules 1 and 2 can buy controlled material, which is rubber-covered wire, for their maintenance and repair requirements, within the limits that are specified, so that they are taken care of all right at the present time in keeping their installations safe.

We now come to what has been in the past the most critical requirement of copper wire. We have all realized from the very beginning of this program that there wasn't copper wire for the civilian industries, such as hotels, restaurants, office buildings and whatnot. Yet with your cooperation, we can prevent undue danger by following this plan.

I know that you have all read our President's proclamation designating Fire Prevention Week from October 3 to October 9 and how he stressed the fact that fires must be reduced and everything possible done to reduce this fire loss. In that direction we can do a great deal but it needs four-way cooperation between the inspector, the War Production Board, the electrical contractor and the electrical wholesaler.

The procedure will work about like this. In the past, whenever an inspector found a hazardous condition, it has been his custom to follow existing rules and ordinances, give the man a warning, if necessary, condemn the building or shut off the current.

To-day, where you have an unsafe condition in any of these civilian buildings, I would suggest that you go to the owner of that building and say, "John, you have a hazardous condition here in your electric wiring. You are apt to burn your building down." "Well," John says, "I can't do anything about it. I can't get the copper wire."

Your response should be, "Let me help you." Then you simply write him a letter outlining the hazardous condition that exists in his building and suggest the changes that should be made to correct that condition. Then tell this owner to call in his electrical contractor and have him survey the job and make out a list of

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LET THEM HELP YOU ON "ESSENTIAL" LIGHTING JOBS

Redesigned to meet the requirements of the War Production Board, these Wakefield units are now available to help you meet the needs of your customers.

Similar in lighting performance to the popular Wakefield units whose names they bear, these new units make use of wood and glass to help conserve critical materials. Simple and attractive in design, they are especially good for lighting war plant offices, drafting rooms and other essential uses permitted by WPB.

They are built to give the kind of service you expect from Wakefield . . . fit companions for the well-known ADMIRAL. And they are Underwriters and Fleur-O-Lier approved. Get full details to help you serve your customers.

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the wire that will be required, in lengths and sizes, to make that job safe. Then tell the owner to make an application to the War Production Board for a priority to get that wire.

When that application is supported by your letter and by the letter from the contractor, that application will be approved, a priority will be assigned sufficient to enable the the wholesaler to make immediate delivery, the work can be started and that unsafe condition can be corrected in a very short time. It is just that simple.

Now, there are two general classes in the unsafe conditions that you will find. Maintenance and repair means repairs to the existing installation as it is, without improvements or extensions. Wire for such use is applied for on a PD-1-A application. As I said, it will be approved promptly.

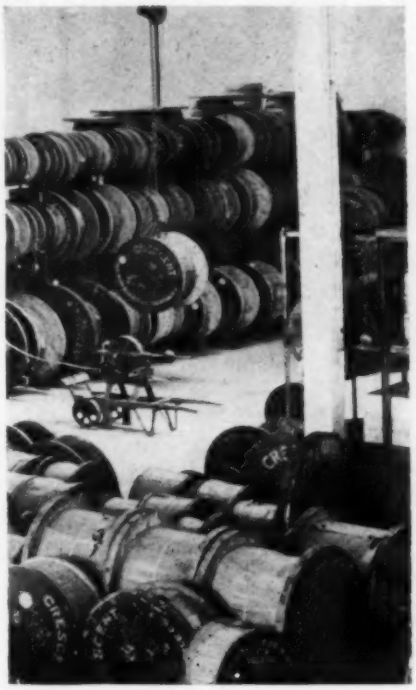
You will find other conditions, and I suppose a great many of them where wires are overloaded. It might be an office building where they have taken on three or four floors of tenants more than they usually have, they have all put in more lights than the building was designed for and, as a result, the copper feed wires are running hot, the switch is hot, the insulation is being fried out of the wires and a fire is apt to happen at most any time.

Or you might find a similar condition in an industrial building where they have added power and light so that they have an overloaded condition on the feed wires.

That requires an improvement, which comes under L-41. The application is made on Form 200-C. But don't let that worry you. Your procedure in either case will be exactly the same and in either case approval and the supply of wire will be furnished promptly.

Now, when I speak of electrical inspectors, I don't mean municipal inspectors only. We have insurance inspectors; we have utility inspectors. Their certification of an unsafe condition will be just the same with the War Production Board, because you are all working on the same lines. There isn't a one of you who has any objective in your business life other than the protection of life and property. That is why the War Production Board will welcome your cooperation.

They have only a limited amount of copper that they can allocate for civilian buildings. They want to put it where it will do the most good. They have many phony applications. For instance, you might find a building that would want to put some ex-



tensions in the lighting system for their own convenience. You might find some who want to increase their lighting for decorative effect, and you will find others who would like to make a PD-1-A application for a nice little stock of wire because they might want to use it sometime.

Now, copper is too scarce to give out for any such purposes. With your privileges, you have a responsibility, and I feel very sure that no electrical inspector would lend his endorsement to help anyone get a supply of wire where he didn't know that a hazardous condition existed. In this way, I have told the War Production Board that if they approve these applications for wire to correct hazardous conditions, fortified by a letter from the inspector and from the contractor, that the buildings can be maintained safely and that not a single pound of copper will be lost or wasted.

Now, with this program, I think you can change your attitude. I know that in the past, when you have found these hazardous conditions, you have winked at them and said, "What is the use? Nothing can be done about them." Something can be done about them now. You should review your territories, find those cases where hazardous conditions exist, operate on the plan that I have suggested, see to it that there is not a hazardous condition in electric wiring in your territory.

While I am talking about the protection of civilian buildings, there is something else I want to mention, and maybe this is the right time.

The war program looks as if victory will not be delayed too long. At the present time you are permitting many deviations from the National Electrical Code and local codes in electric wiring. It is absolutely proper that you should do this to conserve critical materials and to help the war efforts, but when this mess is over, there will be many who will come to you and say, "We have a big stock of this sub-standard material and we would like to have your war regulations extended for a time so we can use up some of this stock."

I want to say in behalf of the electrical wholesalers—and I know that I speak for a great majority of them—that when that time comes, it will be their preference to take their loss at once on any sub-standard materials they may have, so that you may immediately return to your standard National and local codes just as soon as the restrictions are removed on the sale and use of critical materials.

And another thing. It has been eminently just and proper for you, in the conservation of critical materials, to issue temporary permits for wiring that deviate from the requirements in your local ordinances, and again, when this mess is over, it is our hope that you will pull in those temporary permits and see to it that those buildings are rewired according to your ordinances. This will give those buildings the protection that is provided in your codes and it will give our electric wiremen who are in our armed forces something to do when they come back home.

"IT'S GOT TO BE READY BY CHRISTMAS!"

This caption and picture are from the eye-catching *Toastmaster* advertisement appearing in:
Saturday Evening Post, December 4
Life, December 13
Collier's, December 18
with a total audience estimated to be more than 50,000,000

The Demand Will Be Greater Than Ever . . .

Distributors, and their salesmen, can look forward to a tremendous postwar demand for *Toastmaster* toasters. Today, only navy munitions flow from the *Toastmaster* production lines. Preference, however, for America's number one Christmas gift, is growing and accumulating as a result of a far reaching wartime program as follows:

TOASTMASTER'S *national advertising* in the Saturday Evening Post, Life, and Collier's keeps alive in the public mind a desire to own *Toastmaster* toasters.

TOASTMASTER'S *service program* creates profitable work to tide your dealers over this period of merchandise scarcity and at the same time keeps their customers coming into their stores.

TOASTMASTER'S *trade paper advertising* keeps your dealers, whom you see less frequently now, conscious of the postwar potentialities of *Toastmaster** toasters.

TOASTMASTER *Toasters*

REG. U. S. PAT. OFF.

* "TOASTMASTER" is a registered trademark of MCGRAW ELECTRIC COMPANY, Toastmaster Products Division, Elgin, Ill. Copyright 1943, McGraw Electric Co., manufacturers of Buss Electric Fuses, Clark Electric Water Heaters and Toastmaster Products.

Speaking of Post War Selling

Appliance Maker Gives Green Light To Independent Postwar Distributors

J. H. Rasmussen

By J. H. Rasmussen

THE following program was outlined by James H. Rasmussen, commercial manager of The Crosley Corporation, when he addressed delegates to the War Conference of the National Wholesale Hardware Association and the American Hardware Manufacturers' Association at the Hotel Commodore in New York City.

"We agree with those who believe that there is a great pent-up demand for radio and appliances," Mr. Rasmussen said. "We believe that the volume of sales will be even larger, for at least a short time after unlimited production starts, than it was in 1941.

"Like practically every other major manufacturer, we propose to do more business on the products we formerly sold for two reasons: (1) Because the market will be larger; and (2) because we are preparing to secure a larger percentage of the total business.

"We have come to the conclusion that, if we are to keep our peak force of 8,000 persons employed after the flush of the pent-up demand has been satisfied, we must develop markets we haven't formerly been in and that means we must produce new products.

"Some of these products which will be new to us will also be new to industry, or practically new, because the market had hardly been scratched.

"We will continue to produce home radios and television, when it comes. We will continue to produce electric refrigerators and, being in the refrigerator business, it is logical that we enter the room-cooler field, which was just beginning to come into its own in 1941.

"There will be a big demand for frozen food cabinets. Again, that's a field we fit into, because we are in the refrigerator business.

"We plan on enlarged activity in the gas and electric range business, as well as in the washer and ironer business, including an automatic washer.

"We are very much interested in the electric dishwasher. We think that's going to be a big field when we can develop one that really does the job and at a price that people will pay. A housewife spends three times as much time each week in washing dishes as she does in washing clothes.

"These are some of the products we are studying carefully—there are others.

"This diversified product program is not an overnight program. We will not start production on all these products the day the war ends. It may be a five-year or ten-year program.

"We will manufacture first those items which we

REDDY
with the
SEASONING

Gee, when the boss came around an' said it was time to be thinkin' about sendin' the Season's Greetin's to all our Distributor pals the leaves was still on the trees ☆ Anyway, here's the list of T & B Christmas *wishes* I wrote out for one an' all ☆ More prompt-payin' business from war contractors, big an' little ☆ More guys phonin' in for maintenance an' repair numbers ☆ More calls for over-the-counter staples ☆ More appreciation of your war services with love an' kisses from Uncle Sam ☆ More customers thankin' you for expeditin' their orders ☆ More gettin' your foot in the door of post-war re-converters ☆ More old business friends welcomin' a friendly call from you ☆ An' more freedom from worry in this giddy new year ahead ☆ These wishes come from all of us at Thomas & Betts where we're continuin' to dish out electrical fittin's for you Wholesalers to distribute.

Reddy

T&B

formerly produced. We will add new items, one at a time, as we are sure they are ready for production, and when we know that our distributors are ready to absorb them into their programs.

"We believe that we can maintain our employment during the transition period when we are still producing war materials and are getting back on civilian production. However, we will require the addition of these new products to maintain our employment, when the unusual volume which will result from the pent-up demand starts back to normal, and we are no longer producing any military material.

Lowering of Distribution Costs

"Distribution costs in our industry have been reduced considerably during the past ten years. They are low now; much lower than in many other industries. However, if working together, we can learn how to make a fair profit at a reduced cost of distribution from the factory, from the distributor and from the dealer, and still give efficient service—then we will be prepared to make a still further contribution to industry and consumers alike.

"Distributor profits are not too large; costs must be reduced before we can start talking about reducing margins.

"Some manufacturers have decided to handle all or a substantial part of their distribution thorough factory branches. **Some time ago, we announced that there would be no change in our program—that we believe in the independent distributor.**

"This is not a subject which is new to The Crosley Corporation. We have operated branches in several sections of the country, some for more than twelve years. We have been actively studying this phase of our business in our post-war planning program for more than a year.

Independents Give Better Over-All Service

"Our considered opinion is that independently-owned and operated distributorships will deliver a better over-all service to the trade and to the consumers alike, because:

(1) Small business is the basis for the American system of free enterprise.

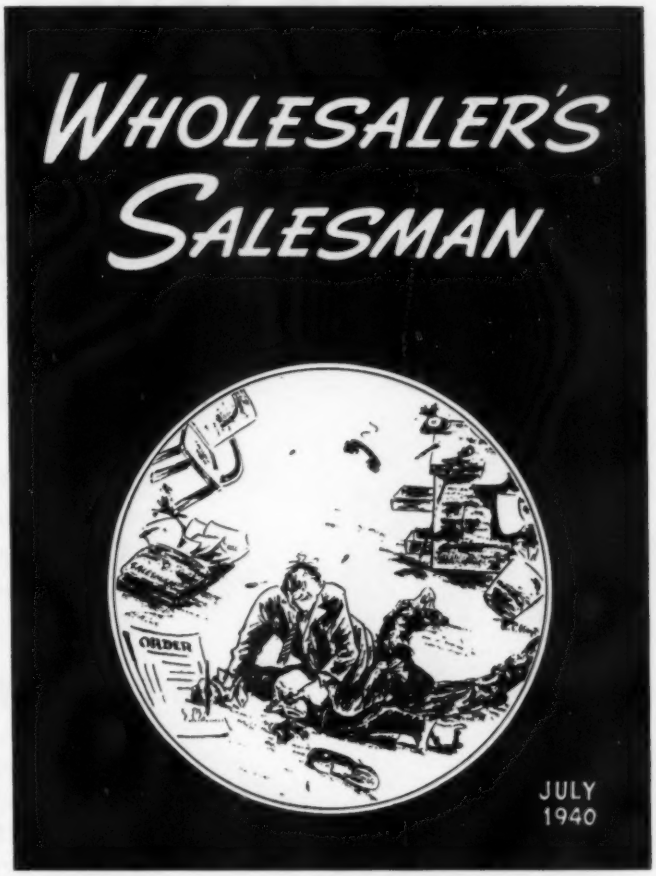
(2) Distributors, with their own money invested in the business, will give better service, as they have more at stake.

(3) And independent distributor knows more about local conditions in his home town and can be of more direct help to dealers.

(4) Factory managers are inclined to "yes" the factory, while independent distributors are more free to criticize, constructively.

(5) An independent distributor's employees render better service because final authority is in the local operation.

"There will always be a place in American business for progressive independent distributors who have the foresight and the ability to meet successfully the ever-changing conditions of the industry. We at Crosley believe in their future and shall direct our merchandising policies accordingly."



IN REVERSE: The cartoon on the front cover of the July 1940 issue of WHOLESALER'S SALESMAN showed a salesman in the act of applying somewhat strenuous methods, to get a signature to an order. Mr. Verrall Moe, sales manager, Moe Brothers Manufacturing Co., Fort Atkinson, Wis., writes us:

"In July 1940 you had quite a lively cartoon on the cover which made a big hit with our Designing Department and it was put up on the wall where it has been ever since.

"Lately, the Designing Department has heard so much about the Sales Department being pestered with orders that the attached cartoon is the result of this inspiration.

"If you would like to use it anywhere, you are welcome to do so with the compliments of our Designing Department."

We are reproducing both, our original cover and the wartime reverse which it inspired, with our compliments to the artist who brought the cartoon up to date and with our thanks to Mr. Moe.

CROUSE-HINDS
Thermostat Condulets
For Heating, Air Conditioning, Refrigeration

FOR HAZARDOUS LOCATIONS

Explosion-Proof and Dust-Tight—Suitable for use in atmospheres containing ethyl ether vapor; gasoline, naptha, petroleum, benzol, alcohols, acetone, lacquer solvent vapors and natural gas; metal dust; carbon black, coal or coke dust; grain dust; combustible fibers.

Type HRC

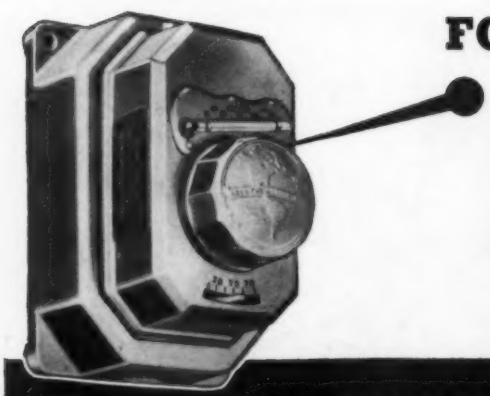
Mercury tube switch.
Threaded flame-tight cover.
Through feed ½-inch union hubs. Either hub can be capped.
Accurate thermometer for indicating room temperature.
Locking arrangement can be furnished to prevent regulating by unauthorized persons.

Listed in Condulet Catalog No. 2500, Section 85, Page 50-3.

Type HR

Contactor snap switch.
Ground surface flame-tight cover.
Reversible. ¾-inch hub can be at top, bottom, or either side.
Accurate thermometer for indicating room temperature.
Regulating knob removable to prevent unauthorized regulating.

Listed in Condulet Catalog No. 2500, Section 85, Page 50-4.



FOR NON-HAZARDOUS LOCATIONS

Type FHRC

Mercury tube switch.
Through feed ¾-inch hubs flush with top and bottom of body. Removable plug for either hub.
Accurate thermometer for indicating room temperature.
Locking arrangement can be furnished so thermostat can only be regulated by authorized persons.

Listed in Condulet Catalog No. 2500, Section 50, Page 22B.

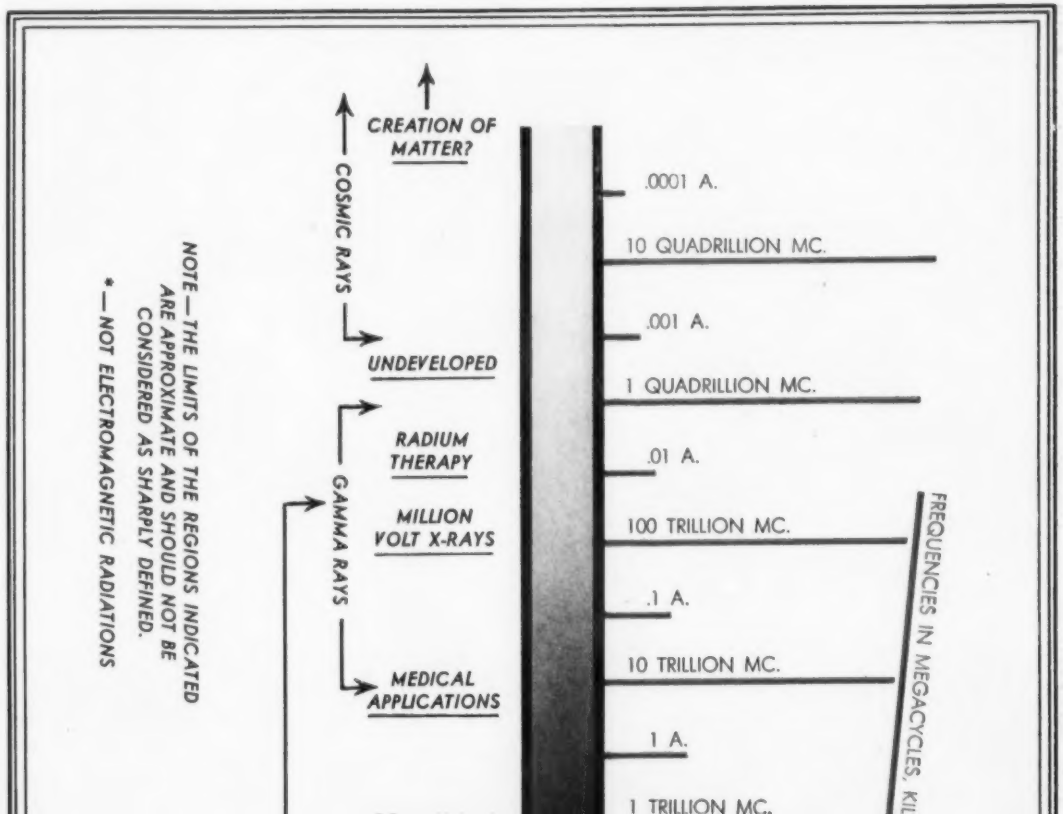
A Nationwide Distribution Through Electrical Wholesalers

CROUSE-HINDS COMPANY
SYRACUSE, N. Y., U.S.A.

Offices: Birmingham — Boston — Chicago — Cincinnati — Cleveland — Dallas — Denver — Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Milwaukee — Minneapolis — New York — Philadelphia — Pittsburgh — San Francisco — Seattle — St. Louis — Washington

Resident Product Engineers: Albany — Atlanta — Charlotte — New Orleans

CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

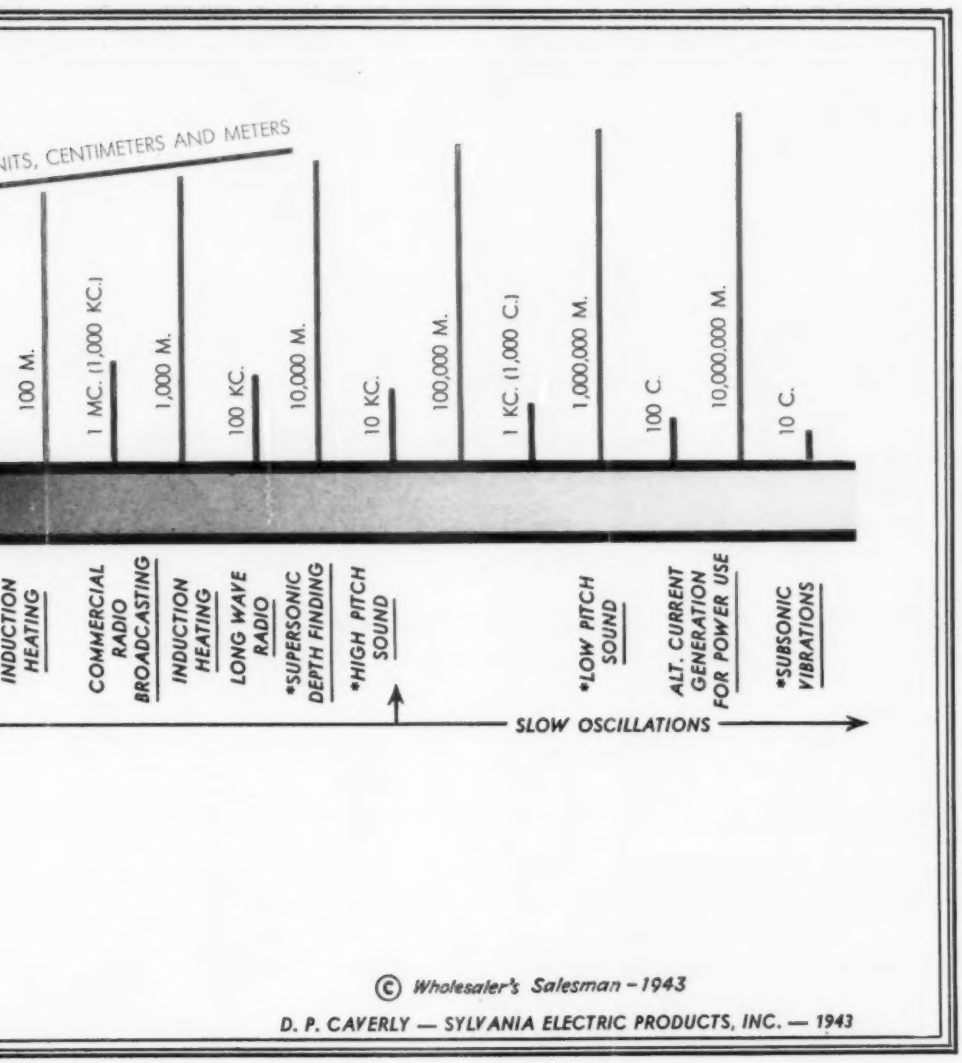

CREATION OF MATTER?
COSMIC RAYS
UNDEVELOPED
RADIUM THERAPY
MILLION VOLT X-RAYS
GAMMA RAYS
MEDICAL APPLICATIONS
.0001 A.
10 QUADRILLION MC.
.001 A.
1 QUADRILLION MC.
.01 A.
100 TRILLION MC.
.1 A.
10 TRILLION MC.
1 A.
1 TRILLION MC.
FREQUENCIES IN MEGACYCLES, KI
NOTE—THE LIMITS OF THE REGIONS INDICATED ARE APPROXIMATE AND SHOULD NOT BE CONSIDERED AS SHARPLY DEFINED.
*—NOT ELECTROMAGNETIC RADIATIONS

THE RANGE OF ELECTROMAGNETIC RADI

Logarithmic Scale

THE RANGE OF ELECTROMAGNETIC RADIATION

Logarithmic Scale



Editorial Supplement

WHOLESALER'S SALESMAN

December, 1943

PART III

ELECTROMAGNETIC RADIATION (Continued)

Chapter 11

Subsonic and Slow Oscillations

At the extreme right end of the electromagnetic wave range diagram, we find radiations having the opposite characteristics of cosmic rays. That is, they are extremely long waves of very low vibration frequency. Although the slowest frequency indicated is 10 per second or 10 cycles, it is possible to produce slower ones since such oscillations are generated by a coil of wire rotating in a magnetic field and the rotation can, of course, be made slow enough to barely move the coil. Such very low frequency and long wavelength electromagnetic radiations, however, are very difficult to obtain, requiring a long antenna and special equipment. They have little if any practical commercial value at present, but they do serve in certain experimental work.

Slow oscillations called *subsonic* are not electromagnetic radiations at all, but are sound waves too slow in pitch to be audible. Although they may have the same frequency as slow electromagnetic oscillations, they should not be confused with them as there is a vast difference in the character of each. They will be discussed further, shortly.

It was indicated in Chapter 6, in the general discussion of electromagnetic waves, that such waves are moving electric and magnetic fields and originate with the movement of electrons. Since electric current involves the flow of electrons from negative to positive, and since a magnetic field is produced around a wire through which electrons are flowing, it follows that pulses or waves can be made to radiate away from a wire with every alternation of the generator. Alternating current is most frequently generated at 60 cycles, although 50, 40 and 25 cycles are occasionally found in this country and more often in foreign countries. Frequencies higher than 60 cycles are usually generated for special purposes. Thus, we may have electromagnetic waves of 25, 40 or 60 cycle frequency, whichever the case may be, or some intermediate or higher frequency depending upon the generator design and speed.

These waves can be detected mechanically, electrically, magnetically or through certain thermal effects of alternating currents. The upper or higher frequency limit of the slow oscillation region is established, more or less, by the ability to mechanically rotate a coil in a magnetic field. This ability is restricted by friction and other natural laws so that the upper limit of 10,000 alternations per second (10 kilocycles), as indicated in the diagram of the range of electromagnetic waves, is an arbitrary one. The top speeds of practical centrifuges used in medical work are in the order of only about 2000 revolutions per second, although experimental devices have been developed which will whirl in air at nearly a million revolutions per minute. It is obvious therefore that to obtain higher frequency oscillations a method other than the mechanical rotation of a coil of wire in a magnetic field must be employed.

During the discussion of resonance in Chapter 5, it was pointed out that a condenser or capacitor can be made to charge and discharge back and forth from one side to the other, and that such "see-saw" oscillations are very rapid as compared to those produced mechanically. This method provides the higher frequencies and will be discussed more in detail later on.

Supersonics

Strictly speaking, the subject of Supersonics (or Subsonics) does not belong in a discussion of electromagnetic waves. Supersonic waves are sound waves of a vibrating frequency (pitch) too high to be heard, and as such, require a medium such as air or water through which to travel, whereas electromagnetic radiations require no medium. But since supersonic frequencies fall between the region of slow oscillations and radio waves, and since electron tubes are involved in their production and control, we can consider them briefly here.

The average human ear is capable of hearing the deep sound produced by vibrations as low as about 20 to 25 per second or 20–25 cycles. Below that, the motion of a vibrating object or string

SCHWARZE-FARADAY

Uni-Pact Signals

are instantly interchangeable

SHOW your customers how to simplify their plant signals—and *save* at the same time—with the ultra-modern Schwarze-Faraday UNI-PACT feature! One outlet, with a single adapter-plate allows instant plugging in of a Bell, Horn, or Kodaire to meet changing plant conditions.

AUDIBLE SIGNALS OF ALL TYPES—The Schwarze-Faraday complete line provides for every particular plant need that may arise. Included are Horns, Bells, Buzzers, Air-Trumpets, Kodaires and Chimes—each a triumph in modern design and dependability.

ASK OUR ENGINEERS—Our factory-trained engineering staff will gladly aid you in designing the most efficient installation to meet your customers individual requirements.

SEND FOR *FREE* CATALOG—Completely indexed, illustrated, and exceptionally easy to use, our new catalog provides an invaluable reference guide for all your signal problems.

SCHWARZE FARADAY

They all fit the same adapter-plate

The Dead-Front Adapter-Plate is a part of each UNI-PACT signal assembly. It is identical for all sizes and fits each one without change of electrical connections.

***UNI-PACT* SAVES TIME, MAINTENANCE AND INSTALLATION COSTS**

SCHWARZE ELECTRIC COMPANY

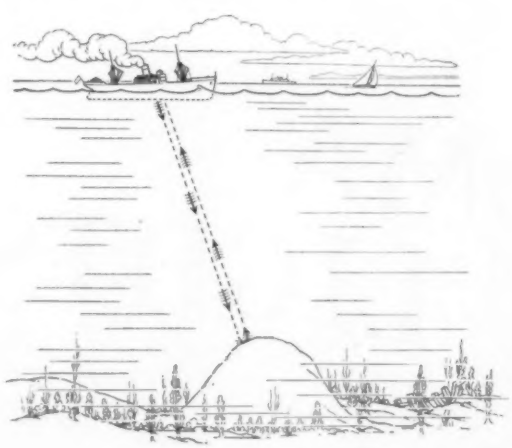
ADRIAN, MICHIGAN

might be seen and felt, but no audible sound is produced and the frequencies are termed *subsonic.*

The upper limit of audible sound is somewhere in the order of 20,000 vibrations per second or 20 kilocycles. At about 15 kc the sound is so shrill as to be most annoying; at 18 kc it begins to fade from audiblity; and at 20 kc there is no sound at all that the human ear can detect although the hearing organs of other animals, birds and insects may be able to do so. This region of sound waves too high in pitch to be heard is called the *supersonic* region.

These waves can be produced electrically with a coil and a metal disc which vibrates at the required frequencies or with certain types of crystals. They can be focused or sent out in a beam similar to the way audible sound waves can be directed with a megaphone. Supersonic waves, however, being of shorter wavelengths than sound waves, can be controlled much more sharply, particularly if traveling through water since they are not dispersed or spread out as readily by the medium through which they are passing.

Thus it is possible to send out a "beam" of supersonic waves. Underwater detection involves such a method of locating submarines, reefs and other submerged objects, and depth-finding with supersonic waves is quite well established. The method involves the calculation of distance in accordance with the speed of the supersonic impulse to the floor of the sea or to the submerged object, and its echo back. As was stated in the section on Sound Waves, in Chapter 6, such waves travel at the rate of 1088 feet per second in air at 32°F. and a little over 4000 feet per second in water. This is much slower of course than electromagnetic wave speed at 186,000 miles per second. Supersonic waves travel at the same rate as sound waves in various mediums of transmission, since they are identical except for frequency and wavelength.



Supersonic impulses sent to the ocean floor travel down and echo back at a constant speed so that accurate calculation of the depth can be made.

The technique of determining marine depths requires that extremely short packets of supersonic waves to be sent to the ocean floor. Otherwise, if the duration of the impulse were long, a "blurring" reception would result with consequent inaccurate calculations of the depth. These instantaneous impulses are sent down at regular intervals and echo back to the receiving device so that the time interval required is in direct proportion to the distance they travel.

The electron tube which controls the duration of the supersonic impulse and the frequency of them is called a strobotron. These act as "trigger" tubes for the supersonic wave beam generator and will be described more in detail in Part IV.

Radio Waves

The electromagnetic waves used in radio extend from the slow oscillation region to an indefinite limit which approaches infra-red radiation. The frequencies range from about ten kilocycles to the region around 10,000 megacycles (thus far), and the wavelengths from 30 to 40 thousand meters to a small fraction of a centimeter. Different bands in this radio wave portion of the electromagnetic spectrum are used for different types of radio communication depending upon how their characteristics can best be utilized.

When commercial radio communication first became practical it was believed that the longer wavelengths and lower frequencies could be transmitted farther and more reliably than the shorter ones, and transoceanic wireless utilized a band embracing wavelengths of from 3 to 30 thousand meters and frequencies from about 10 to 100 kilocycles. Amateur radio operators, at that time considered of secondary importance by some, were assigned a band of shorter wavelengths and higher frequencies so as not to interfere with commercial communication. The amateurs, however, proved their worth by determined and persistent work and it was soon found that their communications of short wavelength high frequency energy were

When the Lights Go On Again

We've heard all about it,
That we'd see with delight
The big twinkling carpet
Of a city a-light!

Now . . . my sister and I
Wait still in the dark,
See only the blackness . . .
And hear the guns bark.

But Christmas is coming
And with it the thrill,
The promise of Peace
And to all men Good Will.

For one night will come
When all men are free
The whole city will twinkle
For sister and me.

NOMA LIGHTS

Now—Noma Toys! Ask dealers about fascinating NOMA WOODIES . . . clever Trains, Trucks, Autos . . . full of fun. Also amazing Walking Dog . . . just pull his leash!

Noma Lights Will Be Back! Their brilliance and gaiety will enliven millions of homes again at war's end. Now their materials go toward Victory. (A few dealers still have Noma Christmas Lights.)

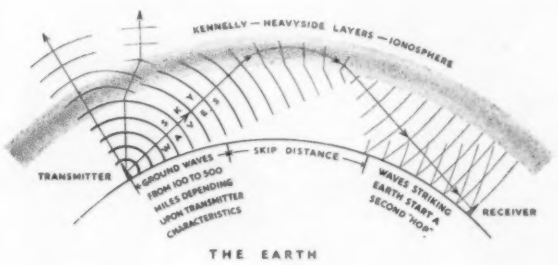
NOMA ELECTRIC CORPORATION

NEW YORK CHICAGO SAN FRANCISCO TORONTO LONDON

extending farther around the globe than the commercial stations using the longer wavelengths.

Investigations as to the reason for this resulted in the discovery that high above the earth there exists a multiple layer of ionized (electrically charged) gas which acts as a refractor for radio waves, bending them back to the earth. If the frequencies are too high, however, (above about 45 megacycles) and the wavelengths too short (less than about 8 or 9 meters) the radiations are not readily bent back, but pass on through out into space. Such layers were referred to in Chapter 9, where it was explained that short wavelength ultra violet from the sun produced its own protective envelope of gas around the earth so that damage to animal and vegetable life would not result from exposure to it.

These layers of electrically charged gas may be found sometimes as low as 30 miles above the earth during the daytime or as high as 200 miles or more at night. They are called the Kennelly-Heaviside layers after those two scientists showed


KENNELLY — HEAVYSIDE LAYERS — IONOSPHERE
TRANSMITTER
GROUND WAVES FROM 100 TO 500 MILES DEPENDING UPON TRANSMITTER CHARACTERISTICS
SKIP DISTANCE
WAVES STRIKING EARTH START A SECOND "HOP"
RECEIVER
THE EARTH

The behavior of radio waves in passing over the earth's surface depends on their refraction from the layers of ionized gas high above the surface.

independently of each other that their existence was highly probable. They are also known as the *ionosphere.* There have been many interesting phenomena observed in conjunction with the ionosphere but we cannot dwell too long upon them here. Its effectiveness as a refractor of electromagnetic waves varies quite widely from time to time. Since it is produced by radiations from the sun it is obvious that changes in the sun's surface (sunspots) will affect its ability to send radio waves back to the earth. While long distance, long wavelength transmission is usually not as good during the day as at night, the reverse is often true with short wavelength transmission. Since the layers are not always consistent as far as thickness or density is concerned, their effectiveness as a refractor of radio waves continually fluctuates, which accounts to some extent for the fading of short wave transoceanic signals. It is interesting to note also that short wave transmission is often less effective at relatively short distances than at greater distances of several hundred miles. This circular band of poor or no reception around a short wave transmitter has been referred to as "skip distance" and results from the fact that radiations traveling nearly straight upward from the tranmitting antenna are not refracted back to the earth as readily as those striking the layers at an angle farther away—similar to the behavior of light waves when passing through a refracting medium. Since lower frequency long wavelength radiations are refracted to an extent that they can almost be considered as reflected, skip distances are much less pronounced with such transmission.

Commercial broadcasting is carried on within a band of wavelengths from about 700 to 200 meters and from 600 to 2000 kilocycles. In order to avoid confusion and interference with others, each broadcasting station is assigned a specific wavelength and frequency at which it may operate, and by tuning our radio to the same frequency and wavelength at which a station is broadcasting we can transform the electromagnetic waves it is sending out into sound without interference from other stations broadcasting at different frequencies at the same time.

Many radios have a short wave band which is established at wavelengths between about 50 meters and 15 or 18 meters, and frequencies ranging from around 5 megacycles to 16 megacycles (5000 to 16000 kilocycles) so as not to interfere with commercial broadcasting. Within this short wave band thousands of amateur radio operators talk with each other across oceans, police officers cruising about a bustling city in their cars talk with and receive orders from the station, airline pilots learn about weather conditions at a distant airport where they are scheduled to land, and music from foreign lands reaches our ears at home in a fraction of a second—all without interference because a different wavelength and frequency is used for each to which we can tune our radio at the exclusion of others.

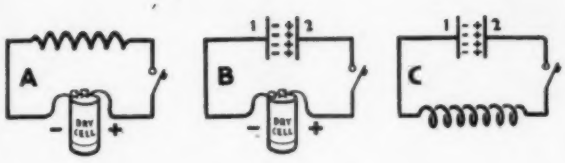
Before passing along to the uses of still shorter wavelengths and higher frequencies of electromagnetic radiations which are used for television, radio ranging and other purposes, it may be well to consider for a moment the basic operating principles of radio transmission and reception.

2500 THE KILLARK LINE Strong . .

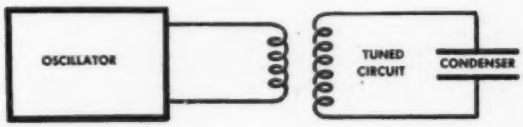
★ For years Contractors—across the country — have looked to Killark fittings, for they knew that great line with 2500 different types and sizes contained exactly what they needed.

Killark fittings offer the Contractor what he wants. They are rugged and strong — easy to handle and install — adaptable and durable—resistant to the forces of destruction—smooth, even threads—sizes and types that assure correctness for the job.

KILLARK ELECTRIC MFG. CO. 3940 EASTON AVE. ST. LOUIS, MO.



The flow of electric current in each of these circuits is described in the text.



An oscillating circuit, providing undamped high-frequency oscillations, is basic in the production of radio waves.

Production of Radio Waves

A circuit containing only a battery and resistance, as shown in diagram A, cannot be "tuned" because while there will be a magnetic field around the wire, it does not oscillate with any frequency or radiate away in waves, but rather might be considered as a stationary field of force around the wire coil. In such a circuit the electrons flow continuously in one direction until the circuit is broken or the battery exhausted. But if a condenser is substituted for the resistance as in diagram B, the electrons will flow out of condenser plate 2, through the battery and into plate 1 in a number depending upon the pressure or voltage provided by the battery and the capacity of the condenser. If the battery is suddenly replaced by a short length of wire, the electrons which had left plate 2 for plate 1 will rush back to plate 2, so that there will again be a balanced equal number in each plate as before. Now, if the battery is replaced by an inductance coil instead of the length of wire, as indicated in C, the electrons, although they will get started more slowly, will keep moving back to plate 2 until it has more than the normal balanced amount and becomes negative (electrons being negative charges) instead of positive as originally, and plate 1 having too few electrons, becomes positive. This inertia, or tendency of current to stay in an inductance coil, is explained in the discussion of Inductance in Chapter 4.

With the two condenser plates again electronically unbalanced, the electrons rush back again to plate 1, with a few too many getting over this time also. Thus a few pulses of current will alternate back and forth through the circuit until they fade into a condition of balance again. When this fading occurs the pulses are said to be *damped* out. Such damping takes place very rapidly as a result of resistance losses in the circuit unless new energy is supplied.

Energy may be supplied to such a circuit and thus provide *undamped* high-frequency oscillations by coupling the circuit to an oscillator as shown in the diagram, so that a pulse through the oscillator circuit will induce a pulse through the other one (see Chapter 4). An oscillator may be a high frequency alternating current generator or it may be a vacuum tube having its elements so designed that controlled pulses of energy will be sent out. Such tubes will be described more in detail in Chapter 12.

A certain amount of time is consumed in getting a pulse under way through either a condenser or an inductance—the larger the capacitance or inductance, the longer the time required. Any combination of a condenser and inductance is therefore responsive to only some one frequency and is, therefore, "resonant" to that frequency. (See Chapter 5.)

Thus we have in the circuit a continuous alternating current which oscillates at high frequency, and radiates or broadcasts electromagnetic energy (via an antenna) in wavelengths and frequencies as determined by the "tuning" characteristics of its condenser and inductance.

The transmission of code messages by radio quite naturally preceded the broadcasting of the sounds of voice and music. In order to transmit code signals it is simply necessary to break up the electromagnetic wave train produced by the oscillating current into dots and dashes of the Morse code by means of a contactor or key.

The transmission of sounds as in radio broadcasting, however, employs a different principle. In this case the train of electromagnetic radiations is not broken as with code signals, but rather is continuous but *modulated* by the much lower frequency oscillations produced by the microphone. In other words, although the higher frequency waves are continuous, they are made to increase or diminish in amplitude (see Chapter 6—Simple Waves) in accordance with the current from the microphone which, in turn, is determined by the sound waves of voice or music which enters it.

Ordinary telephone transmitters contain a thin disc or diaphragm behind which is packed a quantity of small carbon granules. Sound striking the diaphragm causes it to vibrate in accordance with fluctuations of the sound waves. Such vibration results in varying degrees of compression of the

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YESTERDAY

. . . GARCY gave all its skill so that America's millions might enjoy better lighting. But that was before Pearl Harbor.

TODAY

. . . our facilities are almost totally occupied with vital war assignments. On every front the products of our hands and hearts and brains are helping to smash the Axis and speed the day of Victory.

TOMORROW

YOU MAY AGAIN LOOK TO

GARCY

FOR LEADERSHIP IN LIGHTING

BEST STORE LIGHTING
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BEST OFFICE LIGHTING
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and now we add —

BEST SUBWAY LIGHTING

Acclaimed by lighting experts as the best in the country, the comfortable, glareless and shadowless fluorescent illumination of Chicago's brand-new State Street Subway adds one more to the impressive list of "bests" manufactured by GARCY.

Today we have a different job to do. But when it is done and the lights go on again, GARCY will make them brighter and better with the new skills, engineering advances and improved facilities developed while working for Victory.

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GARDEN CITY PLATING AND MFG. CO.

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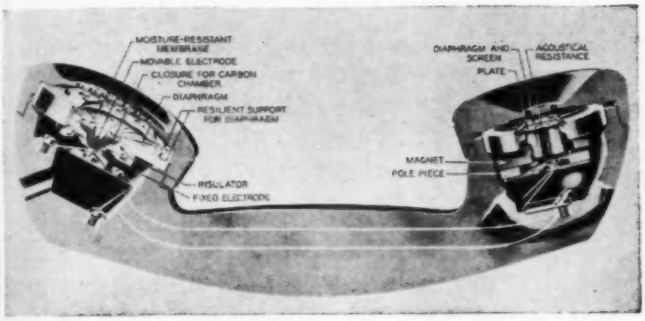


A modern telephone hand-set showing the internal construction of the carbon transmitter (left) and the receiver (right). (Illustration courtesy the Bell Telephone Laboratories)

carbon particles, so that when electric current is passed through them the resistance encountered changes in accordance with the degree of compression of the particles. Thus a telephone transmitter is, in effect, a device to make the electric current passing through it fluctuate almost exactly in accord with the fluctuations of the sound waves which strike it.

The microphones used for radio broadcasting require a more accurate transposition of sound waves into electric current variations and different methods have been developed—some for extreme fidelity, some for sensitivity and others for ruggedness. One type called the induction microphone utilizes induction coils and a metallic ribbon, another makes use of carefully cut and adjusted crystals, and a third method utilizes the principle of a condenser and is called a condenser microphone. In the latter device two parallel diaphragms are used, separated by an air gap in the order of a thousandth of an inch. One of them vibrates in accordance with the sound waves striking it the same as with the telephone transmitter but in this case, instead of carbon granules being compressed, the distance between the diaphragms fluctuates. With the two diaphragms acting as the two plates of a condenser, it can be seen that the capacitance will vary in accord with the vibrations of the sound waves (see Chapter 4—Capacitance) so that a changing current is caused in the circuit connected to the two plates.

It is this changing current from a microphone which *modulates* the continuous train of higher frequency electromagnetic waves produced by the oscillating current of the radio transmitting equipment. The high frequency (radio frequency current) oscillations are called the *carrier waves*, and when they are modulated or made to vary in amplitude in unison with the variations of audio-frequency current from the microphone, they are called *amplitude modulated waves.*

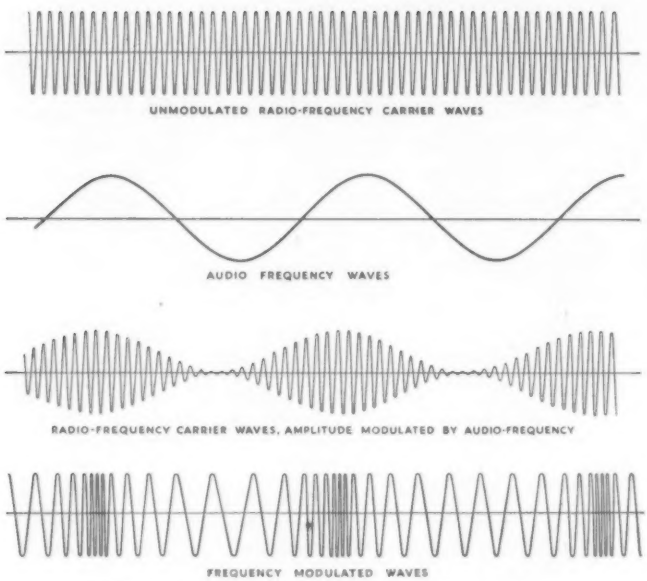
The Reception of Radio Waves

The modulated or broken electromagnetic waves, whichever the case may be, radiate out into space from the antenna and travel at the same speed as light, infra-red, ultra violet, X-rays and all the others of the electromagnetic spectrum—186,000 miles per second.

At the receiving point the incoming train of waves sets up an oscillatory current in the receiving antenna. Since the wavelength of the waves has been established at the transmitting station by adjusting or tuning its inductance and capacitance to a certain frequency of vibration, the reverse must be done at the receiver, that is, the inductance or capacitance of the receiving circuit must be made to match, or put in resonance with, the frequency of the transmitter (see Chapter 5—Resonance). This matching is called "tuning" a radio. When we turn the dial we change the capacitance of a variable condenser (or change the inductance of coils) in our radio set so that it will respond to or pass the same frequency of oscillations radiating from the station to which we wish to listen.

The method of changing the modulated electromagnetic waves back into sound waves via a loud speaker or head phones involves electron tubes (radio tubes) or a crystal detector, and will be covered in detail in Part IV. The pickup circuit must not only be tuned to the frequency of the transmitter but must also provide means of separating the modulating wave from the carrier before the head phones or speaker will vibrate so as to produce sound waves like those entering the microphone in the broadcasting studio.

The basic operating principle of a telephone receiver, radio headphones or a radio loud speaker is essentially the same for each. The function, of course, is to change the fluctuating current back into sound waves. This is done in a manner similar to the reverse of a transmitter, that is, a diaphragm is made to vibrate in accordance with the current variations coming to it from the receiver. A magnet is used, around which coils are wound and the fluctuating current passed through them. The strength of the magnet changes with each fluctuation of the current, and the diaphragm, which is placed in front of the poles of the magnet, is pulled back and forth, thus vibrating rapidly


UNMODULATED RADIO-FREQUENCY CARRIER WAVES
AUDIO FREQUENCY WAVES
RADIO-FREQUENCY CARRIER WAVES, AMPLITUDE MODULATED BY AUDIO-FREQUENCY
FREQUENCY MODULATED WAVES

Illustrating the various types of radio waves.

in accord with the current variations and producing sound waves.

Radio, therefore, is a means of changing sound waves into modulated electromagnetic waves, broadcasting them and then changing them back into sound waves again.

Short Wave Radio

It has already been indicated that as the wavelengths of electromagnetic waves used in radio become shorter, and as the frequencies become higher, their characteristics and behavior change somewhat. Short wave radio is successful in long distance transmission as long as refraction from the layers of ionized gas high above the earth takes place. But when the wavelengths become much shorter than 10 meters, we find they have different characteristics.

One reason why newer developments in radio, such as frequency modulation and television transmission, are in the short wave and ultra short wave regions is so that they will be out of the crowded longer wavelength bands where commercial broadcasting is carried on. Since static disturbances are electromagnetic impulses in a "hodge-podge" of wavelengths and frequencies, it is difficult to sort them out of any broadcast band. Static occurs whenever a bolt of lightning or some other similar disturbance sets up a short train of powerful waves radiating in all directions.

Frequency Modulation

Frequency modulation is a subject to which several excellent text books have been entirely devoted. Basically, it is a method of transmitting and receiving radio waves which are modulated in frequency (and wavelength) rather than in amplitude as previously explained. Amplitude modulation can be compared to sound waves producing one tone of a certain pitch which is modulated or varied in its degree of loudness. Such a tone would waver in intensity but not in pitch like a *tremolo* in organ music. A frequency modulated tone, however, would not vary in amplitude or loudness but would waver up and down regularly in pitch like a *trill* in music.

Frequency modulated radio broadcasts have been placed in a rather narrow band of about 8 or 9 meters wavelength and 45-50 megacycles frequency. Receiving sets designed for the reception of these waves are becoming quite widely used in homes, and the freedom from static interference and the high fidelity of tone resulting with frequency modulation transmission and reception will no doubt make them very much in demand within a short time.

TO BE CONTINUED

For table of contents and chapter summaries see the July 1943 issue.

TID-BITS

In 1918 an infantry division had equipment that amounted to 3,300 horsepower. Today an armored division has 400,000 horsepower, which is estimated to be as much as a city the size of San Francisco has available.

Since the war began nearly 100 new chemical and powder plants have been built.

The leak-proof gas tank on one big bomber requires over 1,200 pounds of rubber.

The average freight train today runs 56 percent faster than in 1920 and carries 40 percent more freight.

A secret newspaper, *Netherlands Awake,* is being circulated in Holland. It appeals to coal miners, railway workers and employees of power companies to sabotage the German occupation program.

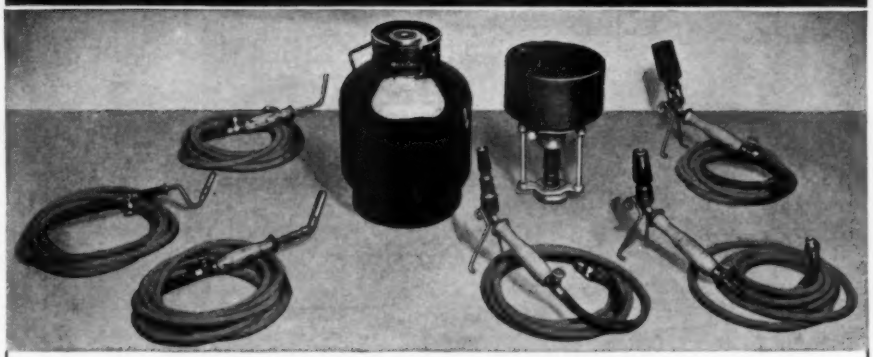
The Western Hemisphere produces half the world's annual cotton crop, four-fifths of which is grown in the United States.

The average tractive power of steam locomotives on Class 1 railroads is now approximately seventy per cent greater than in 1913.

The Boy Scouts are the latest target for the venom of the Nazi propagandists. The Berlin press screamed, "The Scout movement is an unscrupulous instrument of British imperialism which prepared the British youth for war."

"A century of history is today made in a week. The very atmosphere is crackling as though charged with the high potential of momentous problems yet unsolved. . . . God grant that we in America may possess the wisdom and understanding to exert at the proper time and place the full weight of our strength, our ideals and our leadership toward a realistic, economic, and therefore lasting, world peace. To this end may we all join hands and hearts and minds in national unity."—Philip D. Reed, former Chairman of the Board, General Electric Company.

SELL INSTO-GAS TORCHES NOW FOR WAR PLANT MAINTENANCE AND REPAIR



There are six sizes of Insto-gas Torches. They produce flames ranging from a fine pencil size to a 24-inch blast. The metal melting furnace melts 40 pounds of solder in less than 6 minutes. Each torch, hose and furnace is packed in individual shipping carton.

KEEP WAR PRODUCTION ROLLING

Thousands of electricians have used these INSTANT LIGHTING, TIME SAVING Insto-gas Torches and furnaces for war plant construction.

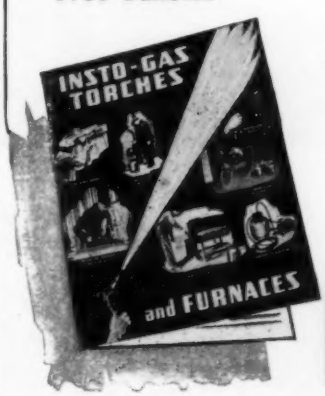
NOW, all war production plants have urgent maintenance work requiring the use of Insto-gas equipment.

Insto-gas wholesalers also furnish gas refill service; a permanent repeat business from every set of equipment sold.

Our unique merchandising plan helps wholesalers sell Insto-gas to their industrial and contractor customers.

A letter or coupon request will bring complete information on — INSTO-GAS, THE MODERN PORTABLE HEAT.

Free Bulletin



MEMO TO INSTO-GAS

Please Mail Bulletin and details on Insto-gas merchandising plan.

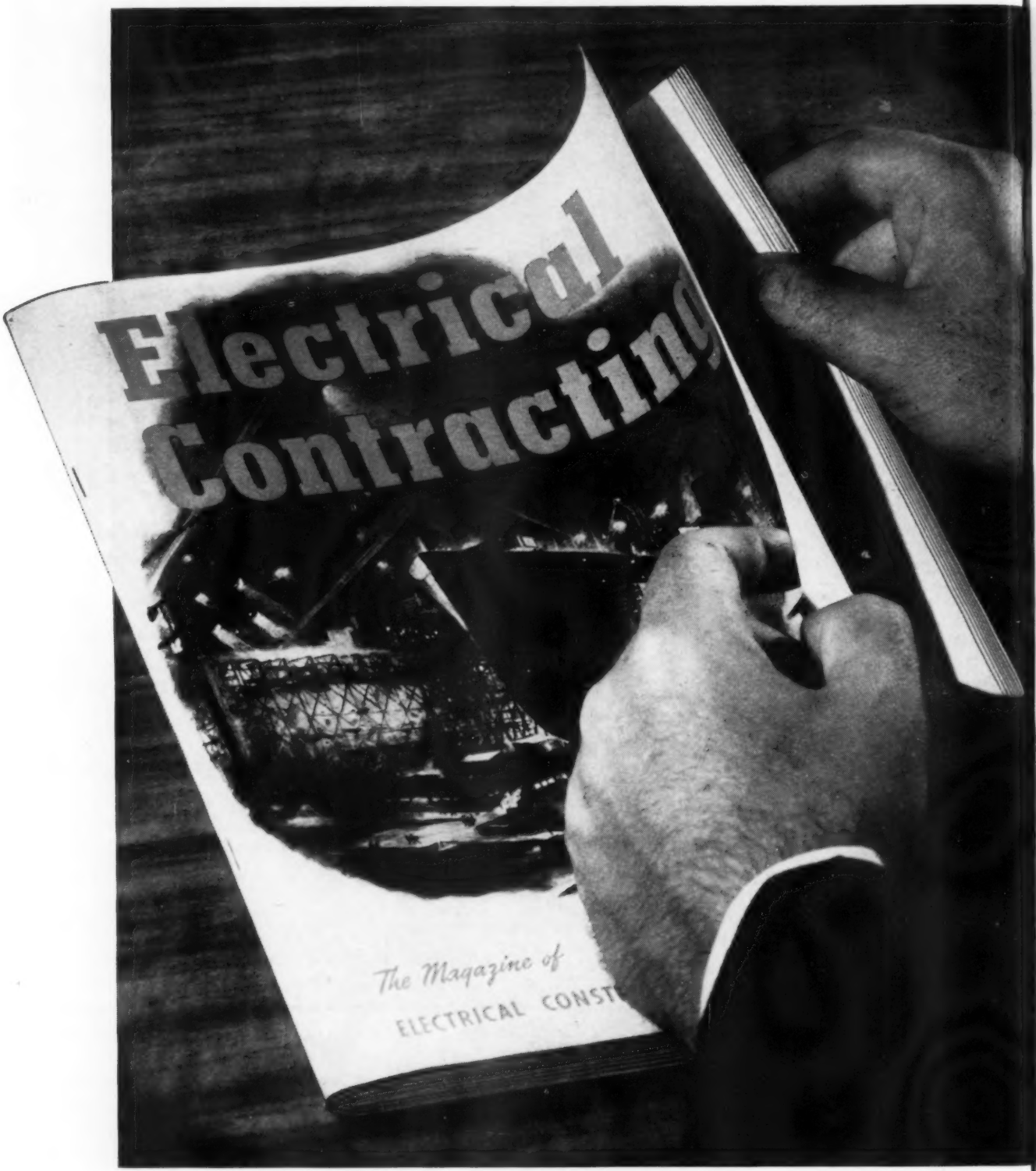
Name_____

Firm_____

Address_____

INSTO-GAS CORP.
DETROIT 7, MICH.

Portrait of a man about to m



A McGraw-Hill Publication
330 West 42nd Street, New York 18, N. Y.

The Magazine o

make your sales job easier

Ever stop to think of how tough it would be if you had to sell completely unknown brands . . . XYZ Fittings—PDQ Tape —Super-Arc Switches, for example?

We're sure you'll agree that it's a lot easier to walk in with the assurance that the way has been paved with advertising . . . the kind that builds reputation, confidence, prestige . . . that creates preference and *makes your job* easier.

That's where Electrical Contracting comes in. When your suppliers back you up with that kind of advertising, in the publication your customers read, then you don't have to spend all your sales time explaining that it's a good company, the product is dependable, and so on through your valuable selling hours.

And don't forget that Electrical Contracting reaches a lot of important men that wholesalers' salesmen can't get to; the influence of your suppliers' advertising on these men can help a lot in swinging the orders in your direction.

Check through a current issue of Electrical Contracting and note how many of the lines you carry are featured. Get behind these lines—you won't have to push so hard!

Electrical Contracting is the *National Magazine* of the electrical contracting field. Its nationwide circulation of over 17,000 paid subscribers includes 7,000 leading electrical contractors and 6,000 top flight industrial electrical men—the people who are your prospects now and after V-Day.

These subscribers buy and *read* Electrical Contracting because in its editorial and advertising pages they find the kind of information they want, and need.

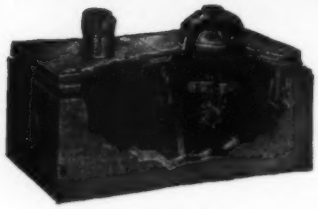
Electrical Construction and Maintenance

SERVING ELECTRICAL CONTRACTORS
INDUSTRIAL PLANT ELECTRICAL MEN

AND OTHERS ENGAGED IN ELECTRICAL ENGINEERING, INSTALLATION, MAINTENANCE

Latrobe PRODUCTS

★ FLOOR BOXES ★ WIRING SPECIALTIES ★



NO. 252-R TWO GANG BOX

Two gang adjustable floor box with No. 208 receptacle in one section. One cover plate with ½" flush brass plug and the other cover with 2" flush brass plug.

NO. 110 LATROBE WATERTIGHT BOX

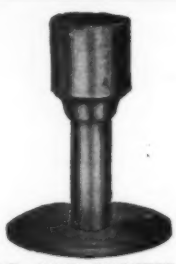
Quickly installed—just attach wires and fasten on cover plate. No small screws, receptacle straps or filler plates to bother with.

Safe, Economical, Easy to Install

Latrobe Floor Boxes and wiring specialties are designed for commercial, industrial and residential use. They may be quickly and easily installed—real time-savers—and may be depended upon for long trouble-free service. Write today for complete catalog and price list of Latrobe Products.

NO. 470 "BULL DOG" PIPE OR CONDUIT HANGER

Made of high grade malleable iron —Strong and sure. Will hang pipe ½", ¾" or 1" to ⅜" steel beam.



NO 280 NOZZLE

In No. 200 Cover Plate Ten Amp. 250 Volt receptacle in Brass Housing, mounted on ½ in. brass pipe extension 3 in. long. Furnished with longer pipe extension if desired.

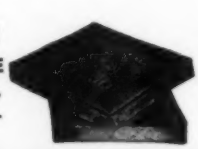
BULL DOG

Insulator Supports made of malleable iron.

FULLMAN MANUFACTURING CO. QUALITY LATROBE SUPREMACY LATROBE, PA.

KEYSTONE FISH WIRE

Flat steel wire highly tempered.



FULLMAN MANUFACTURING CO.

LATROBE . . . PENNSYLVANIA

WPB Orders

Batteries for Flashlights Unrestricted in 1944

No rating will be necessary for distributors who require flashlight batteries for stock and resale on unrated orders after January 1st, 1944, according to the latest information from the wholesale and Retail Trades Division of the War Production Board.

Manufacturers will divide the quantity available among their regular distributors on an equitable basis as the supply available for unrated orders will still be limited.

It has been suggested that wholesalers register with their regular supplier their needs for the first quarter of 1944.

All other types of batteries other than flashlight batteries will continue to be rated on Form WPB-547.

Copper Reports and Orders—Filing Procedure Revised

A letter to "all copper wire mill warehouses" on October 21st from Mr. H. O. King, director, Copper Division, WPB, stated:

"(1) WPB-3009 Report Forms

"(a) Hereafter, WPB 3009 forms shall be filed quarterly, unless directed to the contrary by the war Production Board, reporting deliveries made from warehouse stock, in accordance with CMP Regulation No. 4. The first such report shall be filed not later than January 5, 1944 listing deliveries made during the last quarter of 1943.

"(2) Warehouse Replacement Orders

"(a) 'Warehouse Replacement Orders' may be placed with producers or other warehouses provided that:

"(i) Such orders are to replace copper wire mill products (pounds —copper content) previously delivered from warehouse stock, in accordance with CMP Regulation No. 4, and not previously ordered from any source.

"(ii) All copper wire mill products delivered from warehouse

stock be reported quarterly on form WPB-3009.

"(iii) Each such order is marked 'Warehouse Replacement Order, pursuant to the provision of WPBI-1047.'

"This letter cancels all previous instructions as to the method of reporting copper wire mill products delivered from warehouse stocks and placing orders to replace those deliveries."

Construction Order Direction Given

Pursuant to Conservation Order L-41, part 1075, construction, the following direction has been issued by the War Production Board through J. Joseph Whelan, recording secretary:

"Under the terms of a recent administrative order of the War Production Board, field offices of the War Production Board are authorized to process most applications to begin construction under Conservation Order No. 41 where the cost is less than $10,000. Applications on forms WPB-617 and WPB-2570 in connection with agricultural construction and farm dwellings will continue to be filed with the Department of Agriculture County War Boards. Except as otherwise directed, all other applications to begin construction on form WPB-2570, where the cost of the project is less than $10,000, shall be filed in the War Production Board district office having jurisdiction over the location of the project. Those cases which cannot under the procedures be processed in the field will be forwarded by the district office to the agency or division of the War Production Board having jurisdiction. This change became effective on October 25, 1943."

Construction Order L-41 Redrafted and Simplified

A completely redrafted Order L-41, which limits construction, was issued in simplified form by the War Production Board on November 1st. The language of the new order was announced as intended to make the restrictions more easily understandable to the public.

In addition to simplifying the regulations and the instructions, the

ESSENTIAL LIGHTING EQUIPMENT Promptly Delivered

Simplifies Your Sales Problems

Outlining clearly just what essential orders you can execute for civilian, industrial and farm customers, makes it possible for you to concentrate your efforts along definite lines,—conserve your manpower, help the War effort—and keep your sales volume up, profitably.

VITAL NEEDS MUST BE FILLED PROMPTLY

There still exist many vital war needs. Besides the prime contractors, hundreds of thousands of sub-contracting plants must be kept at top production,—and farm, transportation and oil field demands are growing.

You can sell Steber lighting equipment to speed up production,—Reflectors and Coverlites for room ceiling lights,—for corridors, extended receiving and shipping rooms, and platforms. Deep Bowl Reflectors for high bays and dim-out areas. And Floodlights, permanently mounted and portable types,—Yardlights for farm buildings.

Steber Anticipates Requirements

New items are constantly being offered to provide lighting equipment immediately needed—to aid you maintain volume in your territory, and—Steber policy is simple—"Distribution exclusively through Wholesalers."

Below are a few items you should have in stock, Now.

STEBER MANUFACTURING CO.

2451 North Sacramento Avenue Chicago 47, Illinois

No. 1650 Portable Enclosed Floodlight with telescoping high stand. Furnished in broad, medium and narrow beam patterns.

STEBER LIGHTING EQUIPMENT

RWP-414 Standard Dome Reflector, with shadeholder; 12, 14 and 16-inch diameters for 100, 150, 200 watt lamps.

RWP-112 One-Piece Shallow Dome Reflector with rigid shadeholder welded to reflector. No wiggles, easy to install. Fits weatherproof, composition and porcelain sockets and porcelain receptacles. Ultranamel or Porcelain Enamel finish.

No. 592 Handy Outdoor Floodlight for stationary mounting for use with 200-watt lamp. Enclosing lens has easily detachable ring.

No. VP-12 Streamlined Yardlight with spring suspended sockets which reduce vibration and prolong lamp life. Mounting flange has individual insulated wire-ways. Available in 12" and 14" reflector sizes, wired complete, and in Ultranamel or Porcelain Enamel finish.

Backed by the 75 years experience
and the resources of Calumet &
Hecla, Wolverine quality is now
controlled from ore straight
through to finished product.
CALUMET AND HECLA CONSOLIDATED COPPER COMPANY
WOLVERINE TUBE DIVISION
Seamless Copper — Brass
1425 CENTRAL AVENUE
DETROIT 9, MICHIGAN

revised order makes the following substantive changes:

"1. The limit on farm construction, including residential, is placed at $1,000. Previously there were separate limits, farm residence not being considered part of the farm unit.

"2. A limit of $200 is placed on any type of construction for which a higher specific limit is not authorized by the order. This overall limit was formerly $1000.

"3. The exception, originally made by L-41-b, for the insulating of buildings, has been liberalized in accordance with WPB policy relating to fuel oil conservation. On the other hand, the exception covering the conversion of heating equipment from oil to coal has been eliminated because of the tight coal situation.

"4. Minor capital additions under CMP-5 in certain of the more essential industrial plants are excepted from the L-41 restrictions.

"5. In calculating costs to determine if a job is within the specified L-41 limits, the cost of used materials, or the value of labor furnished free, need no longer be included.

"6. Cost limits now refer to the calendar year, instead of to any consecutive twelve months period.

"7. Installation of plumbing equipment rated on WPB-2631 (formerly PD-851) is permitted if the cost is under $300.

"8. Schedule B, listing various kinds of construction relating to operations of farms, railroads, utilities, mines, etc. which may be begun without WPB permission, has been altered in several respects."

Copper Quantity on V-3 Rating Specified

All copper wire mill warehouses received the following instructions regarding the Allotment Symbol V-3:

"Pursuant to paragraph (i) of CMP Regulation No. 4 you are hereby ordered to reject each Authorized Controlled Materials order for Copper Wire Mill products bearing the allotment symbol V-3 requiring less than 300 pounds (copper content) which you cannot fill from any warehouse stock at the time the order is received."

REPRODUCED FROM

News

(Continued from page 77)

meeting of the Electronics Distributors Industry Advisory Committee in Washington.

Under the proposed plan each of the half dozen manufacturers first would offer for sale to the other manufacturers a certain minimum percentage of each type of tube he manufactures. Frank H. McIntosh, chief of the Radio and Radar Division of the War Production Board, sponsored the plan and presided at the meeting.

Mr. McIntosh pointed out that through such sale between manufacturers all manufacturers would have a supply of all types of tubes. The manufacturers then would offer to the electronics distributors with whom they deal a supply of tubes based on a percentage of the amount of tubes by type which the distributors purchased in 1941.

Although this plan would not necessarily bring about any additional supply of radio tubes for civilians, it was emphasized it should result in a more balanced distribution based on distributors' business in 1941.

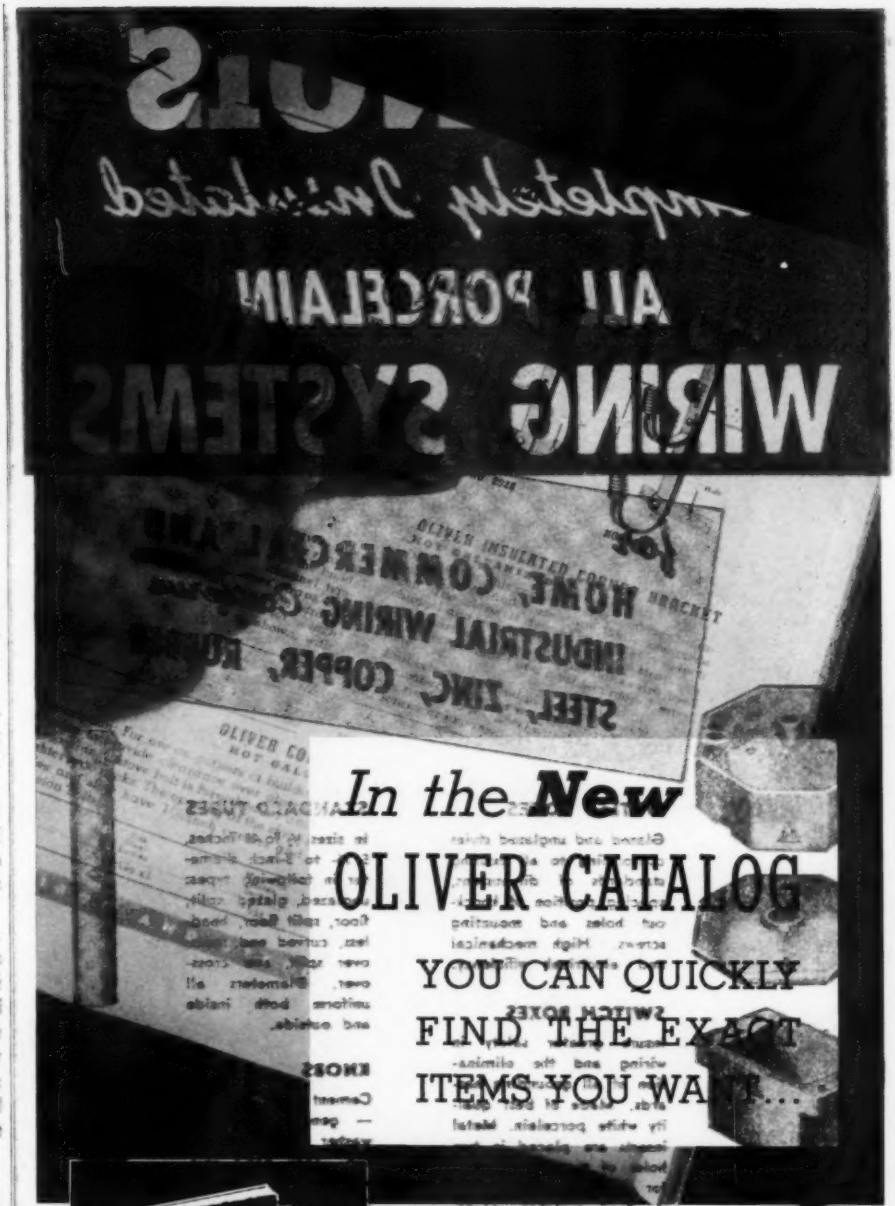
Appliance Makers Ready to Produce

That the public cannot expect radical changes in design and material of electrical appliances immediately after the war, but that production of appliances could start almost immediately after the war is brought out in recent statements by leading executives of two of the largest appliance manufacturing concerns.

At Pittsburgh, before the local Electric League, B. W. Clark, vice-president of Westinghouse E. & M. Co. and president of the Westinghouse Electric Supply Company, stated that "the electric industry can quickly convert back to the manufacture of consumer goods, and will enjoy a tremendous market, far surpassing anything ever seen." He said that he believed manufacturers would go back into production with the tools and dies that were put away when their plants converted to war material production.

Changes Must Await Facilities

Commenting on the same subject, Gerard Swope, president of the General Electric Company in a recent statement regarding the nature of intermediate post-war appliances said that there would be few changes until new materials and new facilities now de-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TODAY!
If you have not yet obtained your copy of this valuable handbook write your name and address on the margin of this sheet and mail today.
Sizes, dimensions and capacities of the items that comprise the complete line of Oliver Pole Line Hardware are conveniently presented in the 1944 Oliver Catalog.
Brand new from cover to cover—with many items never before listed—this volume is a valuable reference data book. With it, you have dimensional and other information needed to plan, specify and order pole line hardware items of latest design and modern construction.
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ILLINOIS

Completely Insulated

ALL PORCELAIN WIRING SYSTEMS

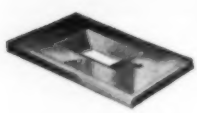
for HOME, COMMERCIAL AND INDUSTRIAL WIRING *Conserve* STEEL, ZINC, COPPER, RUBBER

OUTLET BOXES

Glazed and unglazed styles conforming to all existing standards of dimensions, spacing, position of knock-out holes and mounting screws. High mechanical and electrical efficiency.

SWITCH BOXES

Insure greater safety in wiring and the elimination of all grounding hazards. Made of best quality white porcelain. Metal inserts are placed in two holes of the switch boxes for receiving screws of standard switches, plugs, outlets, etc. Knockouts for single wires, also for cables. Specify and use them.



STANDARD TUBES

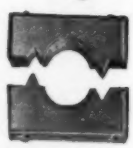
In sizes ½ to 48 inches, 5/16- to 3-inch diameter in following types: unglazed, glazed, split, floor, split floor, headless, curved end, cross-over split, and cross-over. Diameters all uniform both inside and outside.

KNOBS

Cement coated — nail — genuine leather-washer — code standard. They don't chip when driven in and they stay in place.

TOGGLE SWITCH PLATE

All porcelain with beveled edge and decorative pattern on face.



CLEATS

Standard one, two, and three-wire types.

● Not only because porcelain saves vital materials is it valuable today but because these systems give you highest standards in results and offer your customers permanent wiring. Porcelain systems are safe, easy to install, and adaptable to practically all wiring plans and layouts. Grounding is unnecessary. No rusting or corrosion. Install ILLINOIS All Porcelain Wiring Systems the next time you have a wiring job.

TRADE MARK Bull Dog REGISTERED
Look for this Trade Mark

ILLINOIS ELECTRIC PORCELAIN CO.

MACOMB, ILLINOIS

voted to war production — become available."

The important thing for the appliance industry to consider, according to GE's president, is to see "that we give wider distribution to the things we have, that we put down in the homes of all income groups the high-quality electrical equipment that will enable people—many for the first time—to live efficiently and economically and happily." The big job is "more goods for more people at less cost" said Mr. Swope.

1944 Program For Adequate Wiring

Next year's program of service and information for post-war home planners, builders, architects, and home financing institutions was reviewed in the latest issue of the Adequate Wiring Reporter.

Two of the promotional projects outlined were Department store promotion of prefabricated homes, and the Post-War Home Building Club Plan.

Included in the first-mentioned plan is the display by approximately 50 leading department stores in as many cities, of one-quarter-size prefabricated model homes.

The Post-War Home Building Clubs are designed to offer membership to all those who have a sincere interest in planning for the purchase of a new home after the war. Through monthly meetings of these clubs the members will be given the best information available on every phase of home building and planning, including electrical facilities and equipment.

Agent to Specialize In Fluorescent Sales

Jack L. Rowe, formerly transformer and ballast specialist in the Chicago office of the General Electric Co., has established a new sales agency in Chicago, and will act as manufacturers' representative specializing in fluorescent lighting accessories.

Mr. Rowe has announced his appointment as midwestern sales representative for the Kulka Electric Mfg. Co., of Mount Vernon, N. Y., the Abbot Fluorescent Co. of New York City, and also for the fluorescent ballast line of the Acme Electric & Mfg. Co. of Cuba, N. Y.

Mr. Rowe is a graduate electrical engineer from the University of Illinois and a member of the Chicago Section, Illuminating Engineering Society. He has been affiliated with the General Electric Co. since 1927. His new office is in Room 866, Civic Opera Building, 20 N. Wacker Drive, Chicago, Illinois.

FRED H. PINKERTON has been appointed manager of sales promotion and advertising for Reeves Sound Laboratories, Inc., New York. L. D. Ely, president of Reeves announced the appointment of Mr. Pinkerton, who was formerly in charge of sales promotion and advertising for the Industrial Division of the U. S. Rubber Company. He also serves as Public Relations Counsel for N.E.W.A.

Sylvania Adds New Facilities

The purchase of new plant facilities for the manufacture of radio tubes and the acquisition of a site for the construction of laboratory and office buildings was announced last month by Sylvania Electric Products Inc.

A 28½ acre tract of land in Bayside, Long Island, New York, will become the center of research for the company as soon as it is possible to build. Plans have been approved by the municipality for the eventual construction of a campus-like U-shaped center, with buildings to house both the research facilities and the administrative offices.

At Wakefield, Mass., Sylvania has acquired plant facilities which are already being used to augment the company's radio tube production for the armed forces and for vital war industries. The plant is a five-story building containing 35,000 square feet of floor space. Extensive alterations including the installation of fluorescent lighting have been made.

In making the announcement of these new plant facilities, Walter E. Poor, president of Sylvania, explained that the new plant is producing the internal assemblies for radio tubes which are then completed at the Salem plant.

For Your *Post war planning* ... KLEIN'S

This booklet on the care of tools is a Klein contribution to making tools last longer—give better service. Write for a copy.

Victories on many fronts point to the day when power and communication companies will be faced with the peacetime problem of extension and re-habilitation.

Today many utility companies are planning for the future and these plans of necessity call for high quality tools and equipment, for linemen and electricians.

Mathias Klein & Sons are busy making the tools and equipment they have always made. When the war is won, this capacity will be available to produce tools and equipment of the same high quality that has characterized the name Klein "since 1857."

ASK YOUR SUPPLIER

Foreign Distributor: **International Standard Electric Corp., New York**

Since 1857

Mathias KLEIN & Sons

Established 1857 — **Chicago, Ill., U.S.A.**

3200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

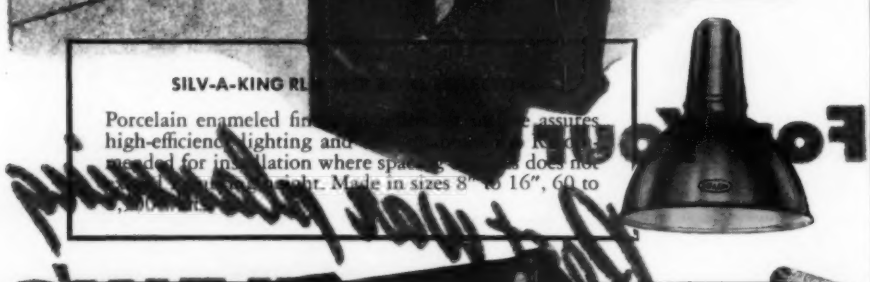
AN UNBEATABLE COMBINATION

Silv-A-KING lighting equipment *plus* Silv-A-King engineering service makes an unbeatable combination! ... behind the Silv-A-King equipment you buy, and Silv-A-King engineering service includes expert guidance in planning the layout of your lighting installation to insure maximum efficiency. And Silv-A-King lighting equipment conforms with RLM and other standards. The highest ... efficiency. Silv-A-King lighting engineers are available to discuss your lighting problems.

Write us for a ... catalog

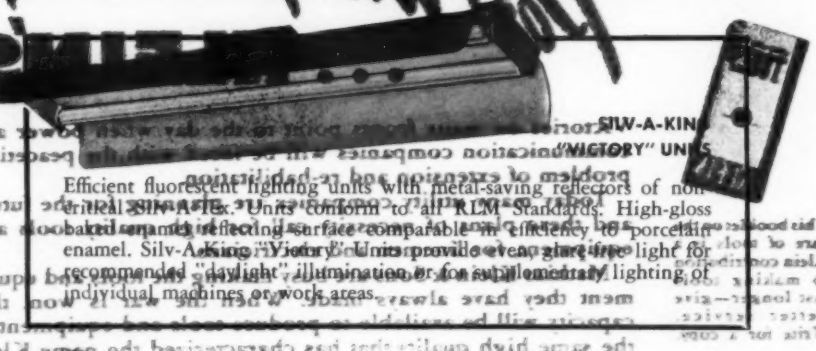
SILV-A-KING RL...

Porcelain enameled fi... assures high-efficiency lighting and ... needed for installation where spacing ... does not ... height. Made in sizes 8" to 16", 60 to ...



SILV-A-KING "VICTORY" UNITS

Efficient fluorescent lighting units with metal-saving reflectors of non-critical SILV-A-TEX. Units conform to all RLM Standards. High-gloss baked enamel reflecting surface comparable in efficiency to porcelain enamel. Silv-A-King "Victory" Units provide even, glare-free light for recommended "daylight" illumination or for supplementary lighting of individual machines or work areas.



SILV-A-KING RLM SYMMETRICAL ANGLE REFLECTORS

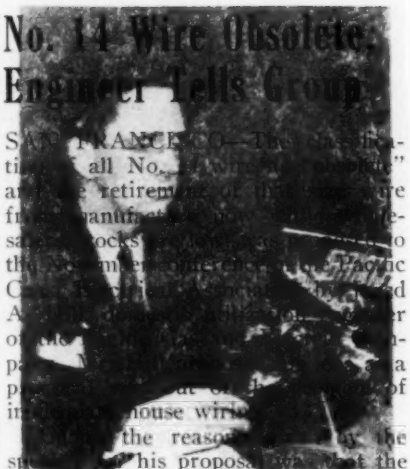
High efficiency, porcelain enameled reflecting surface. Units designed for angular distribution of light for illumination of vertical surfaces, such as walls, signs, etc. Made in sizes 8" to 16", 100 to 1,500 watts.

OTHER SILV-A-KING PRODUCTS

Dust-Tight Units
High Bay Mounting ...
"HIM" High Intensity Mercury
Island Lights
... Diffusers
Stock-Aisle Reflectors
Vapor-Proof Lighting ...

FLUORESCENT
KING
INCANDESCENT

No. 14 Wire Obsolete, Engineer Tells Group



SAN FRANCISCO—The ... all No. ... retirement ... manufacture ... stocks ... the ... Commerce ... Chairman ... Coast ... Association ... Electric ... house wiring ... the reason ... his proposal ... that the No. 14 wire is too small for any circuit use, not only for the higher wattage lamps and appliances which are expected after the war but also for the equipment that was sold during the past few years. Mr. Hill then stated that approximately 85 percent of the No. 14 wire 15-amp circuits now installed in homes are fused at 25 to 100 percent ... of their ...

As the stocks of No. 14 wire in the jobbing houses are now at a minimum, Mr. Hill said, it is a propitious time to discontinue manufacture and stocking of this size.

Claims Support for Idea

In his declaration to the association, Mr. Hill claimed that the elimination of No. 14 wire ... advantages to every branch of the electrical industry. He cited ...

"The electrical wholesaler has been required to stock No. 14 wire in types R, RP, RW, RH, RU and ... each one of them in seven colors to satisfy the color code of the National Electrical Code. The space taken up with the stocking of this one wire seems out of proportion to the profit secured. Certainly No. 14 wire is the one item on which a great deal in price cutting occurs.

"The electrical wholesaler who also sells appliances would secure a double-barreled benefit because the elimination of No. 14 wire would give him more space to stock appliances and would result in the sale of a larger volume of appliances.

"The wiring manufacturers told me that it takes an extra draw to reduce copper to No. 14 size and then they sell it for less money than the larger sizes. They admit that there has never been any reasonable profit in this size of wire ... including the installation of fluorescent ...

"It is unnecessary to say that the home owner could gain more benefits from this ... than any of the other parties involved. ... Hill ... to the West Coast ... of wiring ... there should ... of wiring methods and voiced ...

REPRODUCED FRO...

NEW WIRE FOR THE ARMY Signal Corps telephone has been developed by the United States Rubber Company. An extremely light, two-conductor, wire weighing less than [illegible] pounds per mile, it is used in combat areas by outposts who [illegible] observations to headquarters.

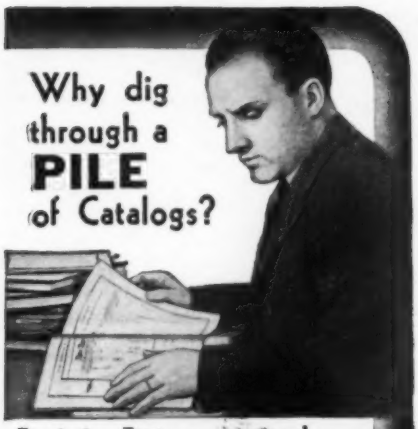
His other recommendations included a uniformity of various ordinances, standardization on automatic circuit breaker panels instead of switch and fuse boxes, and a plan to cooperate with the appliance sales group to further the adequate wiring educational program.

Parts Maker Announces Strict Jobber Policy

A post-war merchandising policy in which all sales are distributed only through established jobbers, has been announced by John Meck Industries, radio and parts makers of Plymouth, Ind.

CONTRACTORS LIKE
THESE BETTER WOOD-BACK R
Required By Army Construction Specifi
Wood-back Racks, a war-time development, are proving far superior to their peace-time predecessors in many respects. They provide maximum safety because they are made of most efficient insulating materials. They are lighter, easier to handle and equal, or superior, performance characteristics than similar metal racks. Made of tough hardwood, treated with a permanent toxic water repellant wood preservative and with insulators securely fastened, they will last indefinitely. Wood-back racks are in service on thousands of jobs throughout the United States. Order your stock today for the convenience of your contractor customers.
FOR NON-METALLIC WIRING CONSTRUCTION
PORCELAIN PRODUCTS, Inc
FINDLAY

ED FROM POOR MATERIAL



Find the Fitting you need—quickly—in the COMPLETE line

If you have a Penn-Union Catalog, you can instantly find practically every good type of conductor fitting. These few can only suggest the variety:

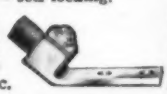
Universal Clamps to take a large range of conductor sizes; with 1, 2, 3, 4 or more bolts.

L-M Elbows, with compression units giving a dependable grip on both conductors. Also Straight Connectors and Tees with same contact units.

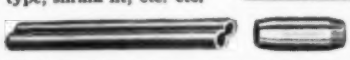
Bus Bar Clamps for installation without drilling bus. Single and multiple. Also bus supports — various types.

Clamp Type Straight Connectors and Reducers, Elbows, Tees, Terminals, Stud Connectors, etc.

Jack-Knife connectors for simple and easy disconnection of motor leads, etc. Spring action — self locking.



Vi-Tite Terminals for quick installation and easy taping. Also sleeve type terminals, screw type, shrink fit, etc. etc.



Splicing Sleeves, Figure 8 and Oval, seamless tubing—also split tinned sleeves. High conductivity copper; close dimensions.

Preferred by utilities, industrials, electrical manufacturers, contractors — because *they have found that "Penn-Union" on a fitting is their best guarantee of Dependability.*

PENN-UNION ELECTRIC CORPORATION
ERIE, PA. *Sold by Leading Jobbers*

PENN-UNION
Conductor Fittings

equivocation or reservation." It reads in part: "Because the jobber has provided, and will continue to provide, a vital function in merchandising, we will continue our policy of sales only to, and through, our recognized jobbers. We pledge that every product leaving our plant will be engineered, produced, packaged and priced as to best conform to the sales needs of our jobbers and dealers. All prices and discounts will be computed on the basis of the costs of intelligent representation by ethically conducted wholesale and retail business."

New Appointments in GE Electronics Dept.

Three new sales managers have been appointed in the Electronics Department of the General Electric Company, Schenectady, N. Y.

According to an announcement by I. J. Kaar, division manager, H. A. Crossland has been named manager of sales of the receiver division. At the same time G. W. Nevin, manager of the tube division, announces that E. H. Fritschel is the newly appointed sales manager of transmitting tubes, and H. J. Mandernach is now sales manager of receiving tubes.

Mr. Crossland entered the service of GE in 1930 as a field representative in the radio sales section of the receiver division at Bridgeport, Conn. In August, 1936, he was made manager of the Field Technical Section of the division, and in the following year became manager of tube sales. He held intermediate appointments and in 1940 went to San Francisco to become regional sales manager for the western region of the receiver division. Shortly before his new appointment, he had been in Schenectady in charge of special military work in the Electronics Department.

Mr. Fritschel has been with General Electric since 1926, working in various positions for the company both here and abroad. Mr. Mandernach was formerly in the replacement tube section at Bridgeport and before that served as district radio representative in the Central West, with headquarters in Chicago.

R. W. Turnbull New Hotpoint President

George A. Hughes, chairman of the board of the Edison General Electric Appliance Co., Inc., Chicago, Ill. announced that Ray W. Turnbull, executive vice-president, has been elected president of the company.

A. D. Byler, former president, who retired because of ill health, will re-

What we are doing *Today* is Uncle Sam's Business

There's a quick-breaking job ahead for far-sighted wholesalers when home construction gets the postwar "green" light. As a pacemaker in the ventilation field, BLO-FAN "SPOT" VENTILATION stands alone. It is unique, revolutionary...combining the advantages of both blower and breeze fan. BLO-FAN "SPOT" VENTILATORS are a necessary auxiliary to *any* heating or air-conditioning system. Remember... BLO-FAN... a sure profit-maker for you ... tomorrow!

PLAN TO SELL

Blo-Fan

"SPOT" VENTILATION

PRYNE & CO., INC.
1245 East 33rd Street
LOS ANGELES
Branches (to be reestablished after war)
SAN FRANCISCO · SEATTLE · CHICAGO · NEW YORK

WOLVERINE APPOINTMENTS—W. H. Maxwell, top, has been made general sales manager of the Wolverine Tube Division of the Calumet and Hecla Consolidated Copper Company, and R. F. Moody, assistant general sales manager of the division, it was announced recently by Otto Z. Klopsch, president of the parent company. Mr. Maxwell has had charge of Wolverine's eastern sales office in New York since 1932.

main with the company as a consultant to the president, and also as a member of the board of directors.

In 1910 Mr. Turnbull began his career with the General Electric Co. as a helper in the foundry. Working his way through the factory assembly lines, he found himself in order-service, then advertising, and eventually as sales manager. In 1931 he was elected vice-president, and executive vice-president in 1940.

• BETTER LIGHT
• BETTER SIGHT
• Better Fight!

No question of it! Light is in the fight! It is ready to help you win production battles.

Make the most of it by using it correctly—to speed up production—to keep workmen more efficient—to eliminate fatigue, cut down spoilage, reduce accidents.

Where skill and precision count, proper illumination is a job for engineering specialists. Goodrich puts them at your service—with the wide variety of porcelain enameled fixtures that answer every industrial lighting requirement.

Serving essential industries is the number one job of Goodrich Illuminating Engineers. Let them help you make the most of light as a fighting tool. Write us.

Sold Only Through Electrical Wholesalers

HIGHLITE STOCKLITE VAPORLITE REFLECTO FLOODLIGHT

GOODRICH
ELECTRIC COMPANY
OFFICES IN ALL PRINCIPAL CITIES

GENERAL OFFICES AND FACTORY: 4610 BELLE PLAINE AVENUE, CHICAGO 41, ILL.

REFUSE OTHERS
RE-FUSE WITH ROYAL!
Originators of:
• "Crystal" Glass-Top
• Tell-Tale Disc
• Hexagon Head
(up to 15 amps)
• Packaging that Sells
Wire • Plug Fuses • Cartridge Fuses • Cord Assemblies • Christmas Outfits

Bulldog Appoints Horace E. Fritschle

An announcement by [illegible] Mitchell, vice president in charge of sales for Bulldog Electric Products Co., Detroit, of the appointment of Horace E. Fritschle as Midwest district manager of the company was made recently.

In his new position, Mr. Fritschle will supervise and direct the activities of the Bulldog district [illegible] Chicago, [illegible] St. [illegible] and [illegible] with [illegible] ers [illegible] Chicago.

Horace E. Fritschle

Starting his electrical career over 25 years ago, in the books of an electrical wholesaler in St. Louis, Mr. Fritschle has been connected with the electrical industry ever since, and has a very wide acquaintance among wholesalers, contractors, and industrials in the Middle West.

Victor Promotes Lee Williams

KANSAS CITY—Mr. Lee Williams, manager of the Kansas City branch of RCA-Victor Distributing Corp., has been transferred to Chicago, where he will assume the responsibility for the direction of the Chicago, Detroit, and Kansas City districts for this corporation. Mr. Gordon Bahl, who has been with the firm at Kansas City for three years, is now acting manager of the local branch.

Solve Shortage of Radio Tubes

MILWAUKEE, WISC.—A partial solution to the problem of getting certain types of radio tubes is reported by local retailers.

They found that a 35Z5 tube can be substituted for a 35Z4, in smaller sets, with only the absence of the Pilot light to inconvenience the customer.

REPRODUCED FROM PO

VERD-A-RAY
before you stock and use
STATE MEDICAL JOURNAL
SAFETY ENGINEER-
department reduced hospital
hospital dressed minor injuries
by 54%, and saved 367 pro-
ductive man hours, by proper
installation of this new lamp.
Ask the sales clerk in any chain
variety store what customers
say about this new lamp when
THEY COME BACK TO BUY
MORE.

Association News

PHILADELPHIA — The Electrical Association reported recently to its members on the progress, development and results of its various activities during the past few months.

The Board of Governors, at their first fall meeting, held Sept. 30, received 65 companies as members. This made a total of 99 new members for the first nine months of this year.

The Association, aware of the importance of keeping the products, functions and services of the membership in the public mind, has instituted an extensive newspaper advertising campaign for institutional purposes and to promote its Electric Appliance Service Plan.

From January first to September thirtieth the Electrical Association used 124,000 lines of newspaper advertising, including 399 advertisements in 56 newspapers.

The Appliance Service Plan, the slogan of which "Fix 'em up—Make 'em do" entitles the dealer, for a participation fee of $5.00, to a 14-inch advertisement over his name, in any Philadelphia neighborhood or suburban paper of his selection. Added to this, each dealer will receive the new window trim and banner, as well as 1,000 printed folders for general distribution.

The Bucks-Montgomery Section of the Electrical Association resumed its monthly meetings for the 1943-44 season on Tuesday evening, September 21, with a dinner meeting held at Bungalow Inn, Jeffersonville, Pa. With Chairman Wm. Stewart Hoyle presiding, a number of matters of current interest were discussed, following which John A. Morrison, managing director of the Electrical Association was presented. Mr. Morrison outlined to those present details in connection with the Electric Appliance Repair Activity.

RICHMOND — C. H. Peck, Jr. of the Anaconda Wire & Cable Company addressed the November meeting of the Electrical League of Richmond, Virginia, in the Hotel John Marshall. Mr. Peck discussed copper and wire as it affects the electrical trade.

Conserve
CRITICAL
MATERIALS
PORCELAIN
WIRING DEVICES
HI-LAG
There is still a definite need to conserve every ounce of critical material — and there is electrical wiring that must be done.
P&S Porcelain Wiring Devices —backed by over fifty years manufacturing experience — will do the job and do it well. Use Porcelain Sockets and Receptacles. Use P&S Surfex, the surface wiring device line made of porcelain.
P&S

Less Fuse Blowing with COOL FUSES

WARE HI-LAG

LINKS LOCKED INTO CIRCUIT

NON-HEATING CONTACTS

Keep Motors Humming

100% Quality

APPROVED BY UNDERWRITERS

Mfgr's. Agents Territory Open

WARE BROTHERS

4420 W. Lake St. Chicago, Ill.

WARE

Renewable

HI-LAG FUSES

KANSAS CITY—The Electric Association of Kansas City reports that Colonel R. E. M. Des Islets, Corps of Engineers, United States Army, discussed the "Flood Control Plan for the Missouri River" at a recent luncheon meeting held at the Hotel President.

At the Association's Electrical Maintenance Engineers dinner meeting, C. G. Roush of Westinghouse Electric & Mfg. Co., who is president of the Association, presented a motion picture on "Electronics" showing the "a b c" of electronics at work. The film ran for twenty-two minutes leaving plenty of time for questions to be asked and answered.

In accordance with the requirements of this association's Constitution and Bylaws, the Board of Directors, on November 2, 1943 elected the following seven members to serve with the two most recent, resident past-presidents, S. W. Fries and E. J. Goetze, as the Nominating Committee to prepare a list of suggested 1944 officers and directors: J. A. Ekstrom, G. G. Burkholder, E. J. McGrannahan, H. E. Scheark, E. G. Agee, C. C. Corneilus, and J. E. Launder. E. J. Goetze, last year's president, is the chairman.

At a recent meeting, W. B. Frackelton of the General Electric Company presented, by means of slides, a thoroughly practical demonstration of electronics as applied in industrial plants. Also on the program was an action-demonstration of a D. C. motor operating from an A. C. line presented by T. E. Johntz, also of the General Electric Company.

BALTIMORE—The Electrical Association of Baltimore held a meeting October 29 at the Engineers Club in that city.

The officers elected for the current year are T. J. Requardt, president; J. Vernon Letmate, treasurer; and R. G. Montgomery, secretary, while W. J. Batchler, J. J. Smith and Paul Douty were made members of the executive committee.

The secretary also announced receipt of a letter from Captain Edward A. Sahli, Quartermaster Detachment No. 1, Aberdeen Proving Ground, about the dayroom that was furnished through contributions of the Association. The letter read:

"I thought you might be interested in knowing that our dayroom, which was so capably furnished through your efforts, won second prize in a contest recently conducted on this Post. To be so honored, with approximately 50 dayrooms entered in the competition, was quite an honor, and we want you to know of the result of your efforts."

SAVING Manpower and Critical Materials

Industrial Lighting Simplified

For general factory lighting and for the lighting and operation of machine tools, much labor and critical material can be saved by the use of Dongan Transformers. Instead of installing separate circuits, simply run branch circuits from the power line. Result: A saving in time, a saving in man power, and a saving of precious copper.

WRITE

for booklet on transformer connections.

DONGAN ELECTRIC MFG. CO.

2989 Franklin St. Detroit, Mich.

"The Dongan Line Since 1909"

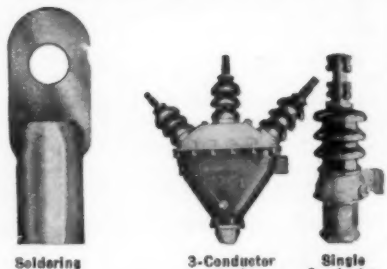
DONGAN TRANSFORMERS

ELECTRICAL SPECIALTIES

FOR HEAVY INDUSTRIAL SERVICE

RMC

FROM STOCK



Write for a complete selection of RUSGREEN *bulletins*

ENDULATORS (POTHEADS) ALL SIZES • ALL SHAPES • ALL VOLTAGES • ALL TYPES • BUS SUPPORTS • SPLICING KITS AND MATERIALS • INSULATING COMPOUNDS

★ ★ ★

RUSGREEN MFG. CO.

14260 Birwood Avenue • Detroit, Mich.

MILWAUKEE—The Electrical League of Milwaukee and the Illuminating Engineering Society recently held a joint meeting in the Public Service Building Auditorium. The speakers were Howard M. Sharp, National President, Illuminating Engineering Society, who spoke on "Lighting—A Modern Profession," and H. Freeman Barnes, General Electric Co., Nela Park, Cleveland, Ohio, who presented, "Light In War—And At Peace." The program also included demonstrations of new developments for the Army and Navy plus lighting opportunities.

A dinner meeting is being planned by the league for the purpose of a general discussion of present and post-war problems of the electrical appliance industry.

MILWAUKEE—The Wisconsin Radio, Refrigeration & Appliance Association of this city recently held an appliance post-war planning conference and dinner meeting in the Sky Room, Plankinton House. Some of the topics discussed at the conference were:

1—Merchandise outlook

2—Would a National Association of Retail Appliance Dealers help to keep the old trade evils out of the post-war picture?

3—Can appliance servicing be kept on a profitable basis after the war?

4—Will sales training courses or schools be needed?

5—Store planning—Can the independent appliance dealer, by proper store planning and advertising, substitute floor selling for doorbell ringing?

6—New lines—How many new producers will come into the appliance field?

7—Competition of chains, cooperatives and catalogue houses.

8—Should the retailer broaden his line, especially in minor appliances?

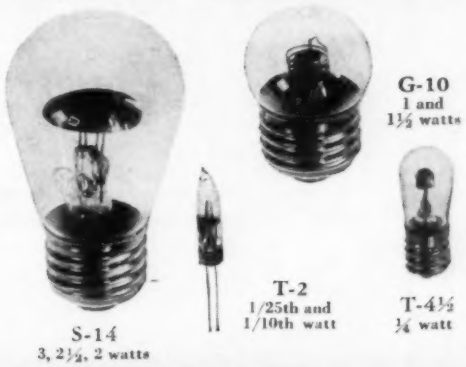
9—Prices of new merchandise—time payment, trade-ins, premiums.

NEW ORLEANS—At a dinner meeting at the St. Charles Hotel, President Kaelin presented Golden Anniversary Fifty-Year Certificates to Messrs. P. H. Kearns and George M. Goodspeed of the Nopsi Company, and Mr. Ernest A. Thibodeaux, superintendent of the lighting plant at Thibodaux, La.

Later in the evening, Mr. Pendleton Lehde, the "electron" pioneer, introduced his associate, Mr. Robert W. Elsasser, who gave a very interesting talk on the subject of "Administrative Thinking." Mr. Elsasser was former Professor of Business Statistics and Management at Tulane University.

GENERAL ELECTRIC NEON GLOW LAMPS for Post-war Product Designs

TYPICAL G-E NEON GLOW LAMPS



ELECTRICAL equipment manufacturers planning post-war products will find many ways to use General Electric Neon Glow Lamps . . . particularly as indicators or pilots. Designers of domestic and commercial electrical devices are specifying these lamps because of these properties:

1 *Remarkable resistance to shock or mechanical abuse.*

2 *Very low current consumption with low operating temperatures.*

3 *Characteristic and distinctive red color.*

4 *Applicability to commercial voltages including higher ranges. (By use of simple small series resistor.)*

5 *Unique electrical characteristics for special circuit use such as self flashing ability on direct current.*

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Marine Equipment—Catalog No. 5, published by the Ballou Service and Instrument Co., Inc., of New York, N. Y., illustrates and describes marine equipment manufactured by this company such as steam whistles, fog horns, sirens, steel and bronze joints, fire plugs, flanges, engine room instruments, etc.

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Radio Tube Charts—A concise pamphlet containing charts and all necessary data on radio tube substitutions has been compiled by Sylvania Electric [illegible], a wartime help to radio servicemen. Includes substitution charts for both 150 [illegible] A-C-D-C receiver tubes, and battery tube types; shows the [illegible] and modifications necessary for tube substitutions; and gives first and second choices in possible replacements in an easy-to-check list.

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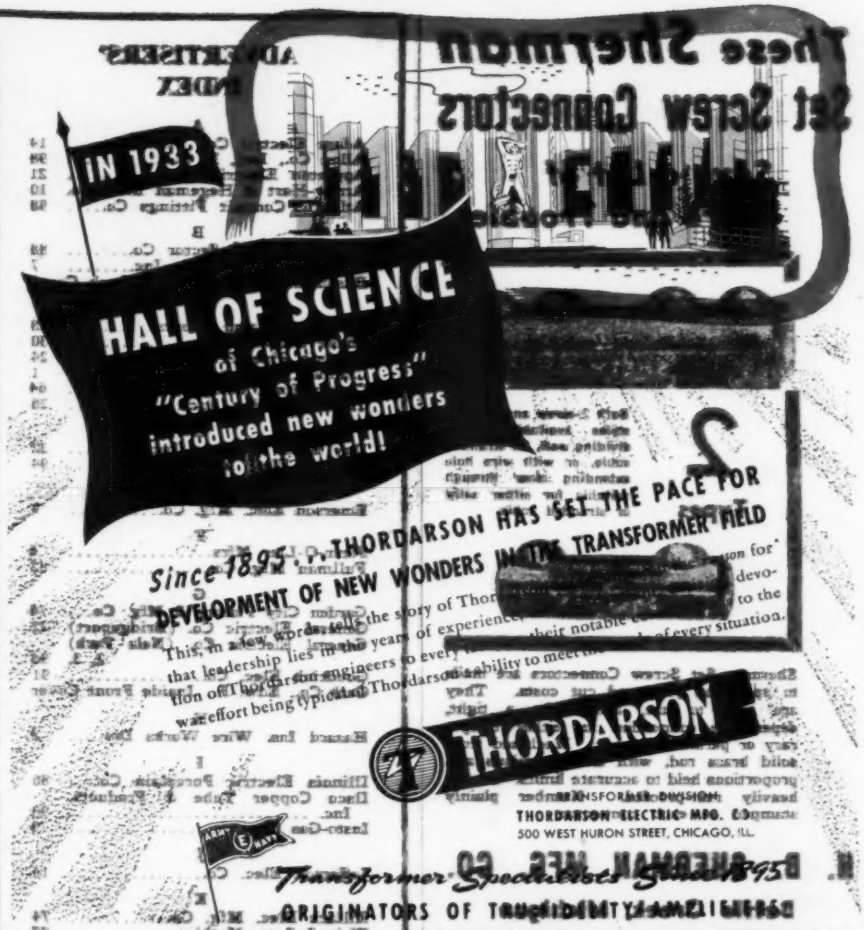
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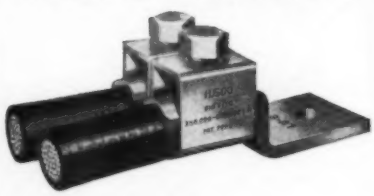

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ADVERTISERS' INDEX

A
Adam Electric Co., Frank..... 14
Allen Co., Inc., L. B..... 98
Appleton Electric Co..... 21
Arrow-Hart & Hegeman Elec. Co. 10
Atlantic Conduit Fittings Co..... 98

B
Bright Light Reflector Co..... 88
Bull Dog Elec. Prod., Inc..... 7
Bussmann Mfg. Co.....Back Cover

C
Champion Lamp Works..... 28
Chase Shawmut Co..... 30
Conduit Pipe Products..... 24
Crannell, Nugent & Kranzer..... 1
Crouse-Hinds Company 64
Curtis Lighting, Inc..... 26

D
Day Brite Lighting, Inc..... 32
Dongan Elec. Mfg. Co..... 94

E
Emerson Elec. Mfg. Co..... 9

F
Fleur-O-Lier Mfrs..... 6
Fullman Mfg. Co..... 82

G
Garden City Plating & Mfg. Co... 76
General Electric Co. (Bridgeport) 22
General Electric Co. (Nela Park) 2, 3, 95
Goodrich Elec. Co..... 91
Guth Co., Edw. F...Inside Front Cover

H
Hazard Ins. Wire Works Div.... 8

I
Illinois Electric Porcelain Co.... 85
Ilsco Copper Tube & Products, Inc. 98
Insto-Gas Corp..... 79

J
Jefferson Elec. Co..... 16

K
Killark Elec. Mfg. Co..... 74
Klein & Sons, Mathias..... 87
Krueger & Hudepohl, Inc..... 96

L
Lloyd Products Company..... 95

M
McGraw Elec. Co. (Toastmaster Products Div.)... 60
Minerallac Electric Co..... 97
Mitchell Mfg. Co..... 23

N
Noma Electric Corp..... 72
North American Lamp Co..... 98

O
Okonite Company..... 8
Oliver Iron & Steel Corp..... 85

P
Paine Co., The..... 96
Pass & Seymour, Inc..... 93
Penn-Union Electric Corp..... 90
Plymouth Rubber Co., Inside Back Cover
Porcelain Products, Inc..... 89
Pryne & Co., Inc..... 90

R
RLM Standards Inst., Inc..... 25
Royal Electric Co..... 92
Rusgreen Mfg. Co..... 94

S
Save Electric Co..... 93
Schwarze Electric Co..... 70
Sherman Mfg. Co., H. B..... 98
Square D Company..... 4
Steber Mfg. Corp..... 83
Sylvania Elec. Prod., Inc..... 68

T
Thomas & Betts Co..... 62
Thordarson Elec. Mfg. Co..... 97
Tork Clock Co..... 98

U
U. C. Lite Mfg. Co..... 92
United States Rubber Co.....18, 19, 66

W
Wakefield Brass Co., F. W..... 58
Ware Brothers 94
Webster Electric Co..... 35
Westinghouse Lamp Co.....12, 13
Wiremold Co. 54
Wolverine Tube Division..... 84

Z
Zenith Electric Co..... 97

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